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The Rockefeller Foundation

Annual Report

1915

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The Rockefeller Foundation
61 Broadway, New York

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THE ROCKEFELLER FOUNDATION

Report for the Year 1915

To the Members of the Rockefeller Foundation:

I have the honor to transmit to you herewith a report on the activities of the Rockefeller Foundation and on its financial operations for the year 1915.

The membership of the Foundation remained unchanged during the year, the following members having been reelected at the annual meeting of January, 1915, for a term of three years:

Harry Pratt Judson, of Chicago, Ill.,
Simon Flexner, of New York, N. Y.,
Starr Jocelyn Murphy, of Montclair, N. J.

Appended hereto are the detailed reports of the Secretary and the Treasurer of the Rockefeller Foundation, the Director General of the International Health Commission, the Director of the China Medical Board, and the Chairman of the War Relief Commission.

JOHN D. ROCKEFELLER, JR.,
President.

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THE ROCKEFELLER FOUNDATION

Report of the Secretary

To the President of the Rockefeller Foundation:

SIR:

I have the honor to submit herewith my report as Secretary of the Rockefeller Foundation for the year 1915.

Respectfully yours,

JEROME D. GREENE,

Secretary.

THE ROCKEFELLER FOUNDATION

OFFICERS, MEMBERS AND COMMITTEES

1915

President

JOHN DAVISON ROCKEFELLER, JR.

Secretary

JEROME DAVIS GREENE

Treasurer

LOUIS GUERINEAU MYERS

Comptroller

ROBERT HORNER KIRK

Assistant Treasurer

LEFFERTS MASON DASHIELL

Executive Committee

John Davison Rockefeller, Jr., *Chairman*

Simon Flexner

Jerome Davis Greene

Starr Jocelyn Murphy

Wickliffe Rose

Finance Committee

John Davison Rockefeller, Jr., *Chairman*

Starr Jocelyn Murphy

Jerome Davis Greene

Nominating Committee

Charles William Eliot

Wickliffe Rose

Alonzo Barton Hepburn

*Members*¹

To serve until the annual meeting of 1918

Harry Pratt Judson

Simon Flexner

Starr Jocelyn Murphy

To serve until the annual meeting of 1917

Charles William Eliot

Jerome Davis Greene

Wickliffe Rose

Alonzo Barton Hepburn

Charles Otto Heydt

To serve until the annual meeting of 1916

John Davison Rockefeller

John Davison Rockefeller, Jr.

Frederick Taylor Gates

¹ On January 26, 1916, the following additional members were elected: Martin Antoine Ryerson, to serve until the annual meeting of 1919, and Harry Emerson Fosdick and Frederick Strauss, to serve until the annual meeting of 1918.

THE ROCKEFELLER FOUNDATION

DEATH OF MRS. JOHN D. ROCKEFELLER

By the death of Mrs. John D. Rockefeller (Laura S. Rockefeller), which occurred at Tarrytown, New York, on March 12, 1915, the Rockefeller Foundation lost one of its honored Founders, for Mrs. Rockefeller's gift of June 7, 1913, was practically simultaneous with her husband's first direct gift to the Foundation after its incorporation; and her confidence in it as the guardian of trusts that were dear to her was shown by three more gifts during the same year. After her death, her executors, acting within the discretion given them by her will, and in accordance with her known wishes, allotted to the Rockefeller Foundation from the residuary estate a fifth large gift for the general purposes of the Foundation, thus constituting an unrestricted fund which, whether preserved as endowment or applied outright to beneficent purposes, will commemorate the gentle and kindly spirit of the giver.

FUNDS RECEIVED

The donations to the Rockefeller Foundation amounted on January 1, 1915, to \$100,073,000, of which \$100,025,000 represented gifts from Mr. John D. Rockefeller and \$48,000 gifts from Mrs. Rockefeller. These funds were increased during the year by a gift from Mr. Rockefeller

of \$12,000 par value consolidated 5 per cent. gold bonds of the Canada Southern Railway Company,¹ the income of which is to be paid at the discretion of the Foundation to the Baptist Home for the Aged of New York City, and by a gift from the executors of Mrs. Rockefeller of securities valued, with accrued interest, at \$340,873, making the total donations received by the Foundation since its establishment \$100,425,873.²

EXPENDITURES

The expenditures of the Foundation through its own organizations and by gifts or pledges to other agencies during the year 1915 (excluding expenditures on account of pledges made in former years) may be summarized as follows:

Administration.....	\$66,542.48
Equipment, Library, etc....	30,354.33
International Health Board..	441,301.23
China Medical Board.....	157,623.40
War Relief.....	582,339.58
Investigation of Industrial Relations.....	19,509.77
Scientific Studies of Govern- mental Problems.....	50,000.00
Gifts and Pledges to Un- affiliated Agencies for ob- jects designated by the Foundation.....	1,173,212.50 \$2,520,883.29

¹ This gift was supplementary to a gift of \$25,000 made on December 15, 1914, for the same purpose and in the same securities.

² See Appendix—Letters of Gift. Page 349.

Gifts for objects designated
by the Founder in accordance
with his letter of gift
of March 6, 1914.

1,341,561. 11

\$3,862,444. 40

ACTIVITIES OF THE YEAR

The activities of the Foundation have been divided during the past year, as before, into two main branches. The first comprises the work carried on by the Foundation through its own subsidiary organizations or agents, namely,

The International Health Commission,

The China Medical Board,

The War Relief Commission,¹

The Director of the Investigation of Industrial Relations.

The second branch of the Foundation's activities consists of its gifts to other agencies, a list of which will be found in the Treasurer's Report.² Under this heading are also included certain gifts for charitable objects designated by Mr. John D. Rockefeller in accordance with the terms of his letter of gift of March 6, 1914, such objects being invariably approved by the Trustees or the Executive Committee as being consistent with the corporate purposes of the Foundation.

¹ Under this heading are included certain contributions to war relief through unaffiliated agencies.

² Page 313.

OFFICES OF THE FOUNDATION

On January 6, 1915, the offices of the Foundation were established on the twenty-seventh floor of the Adams Building, 61 Broadway, New York City, nearly the whole floor having been secured for the use of the Foundation and the General Education Board. In April the headquarters of the International Health Commission were moved from Washington to the space assigned to them in the offices of the Foundation, and the administrative facilities of the two organizations were consolidated.

The rapid growth of the foreign work of the International Health Commission, necessitating an increase in the facilities for bookkeeping, correspondence, purchasing, etc., soon made it evident that the business side of the Foundation's organization should be expanded to meet the new needs. Accordingly, the office of Comptroller was created and the services of an engineer, Mr. Robert H. Kirk, were secured in that capacity. By vote of the Committee, acting with the advice of Messrs. Price, Waterhouse & Company, Chartered Accountants, the Comptroller was charged with the duty of keeping the detailed accounts of the appropriations and disbursements of the Foundation, leaving to the Treasurer the custody of the securities and the drawing of checks upon duly authorized vouchers, with only the bookkeeping incident

to these latter operations. By these changes the Treasurer and Assistant Treasurer have been given more time to assist the Finance Committee by presenting the information needed in the care of investments; and, in accordance with approved usage, the function of keeping the books has been separated from that of collecting and paying out the income. At the same time, the Comptroller is of assistance to the executives in supplying the bookkeeping information that is currently needed, while he also furnishes a check upon their expenditures by keeping track of the limits set by budgets or other authorizations.

INTERNATIONAL HEALTH COMMISSION

The Annual Report of the Director General of the International Health Commission makes an impressive exhibition of the extensive activities of the Commission in the relief and control of hookworm disease in the United States and foreign countries. During the year 1915 the work was actually in progress in Antigua, British Guiana, Dutch Guiana, Grenada, St. Lucia, St. Vincent and Trinidad in the West Indies; in Costa Rica, Guatemala, Nicaragua and Panama in Central America; and in Egypt and Ceylon. In addition plans were made and a budget adopted for the extension of the work to Salvador, British Honduras and the Seychelles Islands. In the Federated Malay States

a special commission was at work to determine the rôle of hookworm disease and malaria as factors in the marked debility of the population. In Hunan, China, an investigation into the prevalence of hookworm disease was carried on. An investigation of medical education and public health in Brazil was determined upon. Plans were formulated and budgets adopted for experiments in the relief and control of malaria in two of the Southern states, Mississippi and Arkansas, the object being to ascertain whether methods of intensive attack analogous to those which have been successful in the suppression of hookworm disease might be applied to the control of malaria, a disease which, taking the world as a whole, is probably the heaviest handicap on the welfare and economic efficiency of the human race.

In coöperation with the government of the Philippine Islands, arrangements have been made for the equipment of a hospital ship to serve as a travelling dispensary in the islands of the Sulu Archipelago, with the object, first, of bringing medical relief to a population which entirely lacks such resources; second, of making the inhabitants of these islands more amenable to civilizing influences, a result which previous experience with some of the wildest tribes in the Philippine Islands has shown to be possible; and third, of developing a kind of medical service which, if successful in the Sulu Archi-

pelago, might not only be taken over by governmental agencies in the Philippine Islands, but also be capable of almost unlimited extension among the innumerable islands of the East Indies and the South Pacific.

Under the inspiration of the success which has attended the efforts of the United States to eradicate yellow fever from Cuba and Panama, a work the indirect result of which has been to protect the southern United States and Central America from the danger of recurrent epidemics, the International Health Commission decided to study the feasibility of eradicating the disease from the remaining endemic foci. A Commission was accordingly appointed to ascertain the number and location of these foci and to inquire into the possibility of ridding them of infection. The Commission, consisting of a number of trained sanitarians experienced in yellow fever work, under the chairmanship of General William C. Gorgas, Surgeon General of the United States Army and a member of the International Health Commission, did not begin its labors until after the period covered by the present report.

The significance of the extensive and varied activities of the International Health Commission is to be found not in any expectation that the organization and funds at its disposal can complete the task of controlling or eradicating the formidable diseases to which its attention

has been given, but rather in certain characteristic policies to which the success attending the previous work of the Commission may be attributed. The first of these policies is that of working through governmental agencies, both state and local, and in coöperation with the medical profession, public schools and other social agencies; in other words, through those agencies which the people regard as their own and on which the ultimate responsibility must inevitably rest. The second is that of relying upon popular education and on stimulating the interest of the common people rather than upon official exhortation or legislation to enforce the therapeutic and hygienic measures essential to the public health. The third, which is a more recent development of the experience of the International Health Commission, has been that of demonstrating in a limited area in each country the feasibility of bringing the disease in question under complete control, by the intensive coöperation of all the agencies concerned. By showing that it is possible to clean up a limited area, an object lesson is given, the benefit of which is capable of indefinite extension. The fourth policy is that of laying constant emphasis on the necessity of keeping the cost of the work down to a point so low that the feasibility of maintaining the work out of the available public and private resources will become ultimately even if not at first apparent. A

philanthropic agency amply endowed might go into a community and by lavish expenditure benefit a certain number of individuals; but if such benefit were conferred at a cost beyond the reach of similar communities throughout the country, the results would be of slight value as compared with those achieved by a policy of intelligent economy. The resources of the largest private endowments are insignificant in amount as compared with the aggregate cost of the community's physical and social betterment. The highest service that private endowments can render is therefore to furnish by invention, initiative and experiment, a demonstration the effect of which may be to determine, to a very large extent, the direction in which the infinitely greater resources of the community shall be applied.

In the case of hookworm disease and yellow fever, the technique of control has been established upon a reasonably satisfactory basis. What is chiefly needed is the extension of methods already known and successfully applied. In the case of malaria, while methods of treatment and control can be effectively applied under ideal conditions, it is still necessary to discover whether the various known measures, such as quinine treatment, screening and drainage operations, can be effectively employed, separately or in combination, at a cost which will not be prohibitive in those communities which suffer most from the disease.

The testimony of the Immigration Department of Trinidad, that the economic efficiency of the laboring population in the area in which the work of the International Health Commission was carried on has been increased in one year by more than twenty per cent, measured in hours of effective labor, would indicate that the known economic results of such public health work would justify increased expenditures. It must be remembered, however, that the expectation of economic, as well as physical benefit is one which makes large demands on the faith of a disease-ridden people, and that a scale of expenditure which might eventually justify itself might, as a matter of fact, be prohibitive at the outset. It is at this point that a private agency is able to do its greatest service.

Not the least valuable results of the work of the International Health Commission are to be found in its effect on other diseases incident to unsanitary and unhygienic living. The sanitary improvements that are brought about by the hookworm campaign tend to diminish typhoid fever and other intestinal diseases. Moreover, a public health administration that has been organized or re-animated to deal effectively with hookworm disease has in that very process become a more efficient protector of the community against all other diseases susceptible of control.

The report of the Director General properly

lays stress upon the policies and aims which are the subject of the foregoing observations. It is, however, a source of profound gratification that the personal ministrations of those who have coöperated with the Rockefeller Sanitary Commission and its successor, the International Health Commission, in actual contact with hookworm disease in the field, have reached 1,462,726 individuals who have been microscopically examined, of whom 534,215, or 36.5 per cent, have been found infected. To have improved the health and increased the economic efficiency of a large proportion of those found to be infected is a service which amply justifies the money and effort expended, to say nothing of the more far-reaching and permanent results which will follow from this achievement regarded as a demonstration.

MEDICAL WORK IN CHINA

The Annual Report for 1914 gave an account of the inquiries made by the China Medical Commission of the Rockefeller Foundation in regard to the needs of medical education and public health in China, and recorded the establishment of the China Medical Board for the purpose of carrying out the recommendations of the Commission. The first Annual Report of the Director of the China Medical Board is appended to this report.

As the plans of the Foundation for work in China were based upon the medical work already

carried on by the missionary societies of the United States and Great Britain, and were actuated by a desire for the most sympathetic coöperation with these societies, the President of the Foundation addressed to them, under date of March 15, 1915, a circular letter giving an official assurance of this desire. The letter stated that, in carrying out its plans, the Foundation might find it desirable:

“1. To assist Missionary Societies to strengthen their medical schools and hospitals by providing equipment and other facilities and by making annual grants, as may be found expedient, for the support of physicians and nurses selected by the respective Missionary Boards, subject only to the Foundation’s approval of the professional qualifications of the appointees.

“2. With the consent of the Missionary Boards, to reorganize and expand existing medical schools, with their hospitals, and to support these, wholly or in part, from its own funds.

“3. To aid other medical schools that are not strictly missionary.

“4. To establish, equip and support new medical schools and hospitals. In choosing its agents, physicians and nurses for independent schools or hospitals, the Foundation will select only persons of sound sense and high character, who are sympathetic with the missionary spirit and motive, who are thoroughly qualified for their work professionally, and who will dedicate themselves to medical ministrations in China. Beyond these qualifications, the Foundation cannot properly impose tests of a denominational or doctrinal nature, such as are deemed desirable by Missionary Boards for their own medical missionaries or agents.”

The Foundation has been gratified by the cordial reception given to these expressions of its intentions, and still more by the coöperation which has marked the inauguration of its work during the past year.

Among the recommendations made by the China Medical Commission were the following:

“First, that the first medical educational work organized should be in the city of Peking and that it be in connection with the Union Medical College, if suitable arrangements can be made.

“Second, that on account of the population, wealth and convenience of location of the city of Shanghai, the second medical work of the Foundation be established in that city.”

In accordance with these recommendations, the China Medical Board has devoted much of its attention to developing medical education in Peking and Shanghai. In addition, it has coöperated with many missionary societies by assisting them in their work in other parts of China, with the result that the Board has made contributions to hospitals in ten out of the eighteen provinces. Thus far, little has been done in southern and western China.

During the year 1915 there were various negotiations ending in the transfer of the Union Medical College from the control of the six missionary societies which had previously been responsible for it to a board of thirteen trustees incorporated under the laws of the State of New York as the “Peking Union Medical Col-

lege." Of this board of trustees seven members are appointed by the China Medical Board, and one each by the following missionary societies: London Missionary Society, Society for the Propagation of the Gospel in Foreign Parts, The Medical Missionary Association of London, Board of Foreign Missions of the Methodist Episcopal Church, Board of Foreign Missions of the Presbyterian Church in the United States of America, and American Board of Commissioners for Foreign Missions.

The situation in Shanghai was somewhat different from that in Peking. For the past five years the Harvard Medical School of China had been at work there, coöperating, since 1913, with the hospital of the Red Cross Society of China. In addition, there was the medical department of the St. John's University, conducted in coöperation with the Christian Association of the University of Pennsylvania; and at Nanking, only six hours away, the University of Nanking supported a medical school of its own. Plainly this situation was not in harmony with an ideal combination of medical resources which should serve the entire lower Yangtze valley.

At its meeting on January 28, however, the Board considered a letter from Dr. Robert C. Beebe, Secretary of the China Medical Missionary Association, transmitting the following resolution passed unanimously at a meeting of

representatives of St. John's University, University of Pennsylvania Medical School, University of Nanking and the Harvard Medical School of China:

"Inasmuch as the China Medical Board of the Rockefeller Foundation has in view the establishment of a medical school in Shanghai which shall work in cordial and sympathetic coöperation with missionary societies, and in which it is desired to merge existing medical schools, the representatives of St. John's University and Pennsylvania Medical School of the University of Nanking, and of the Harvard Medical School of China, in a joint meeting, held in Shanghai, Thursday, November 4, 1915, extend a cordial invitation to the China Medical Board to establish in Shanghai a Medical School which shall be conducted by a board of trustees upon which would be represented the governing bodies of the coöperating schools."

Acting upon this invitation, the China Medical Board is developing plans for the establishment of a new medical school in Shanghai in which the goodwill of all the coöperating agencies will be joined.

In order that the Foundation might be guided by the best advice in regard to the technical questions of policy and personnel involved in the carrying out of its general program, a new Commission was sent to China in the summer of 1915. Its membership consisted of Dr. Wallace Buttrick, Secretary of the General Education Board and Director of the China Medical Board; Dr. William H. Welch, Professor of Pathology in Johns Hopkins University, and

Dr. Simon Flexner, Director of the Laboratories of the Rockefeller Institute for Medical Research. During the five months of their absence from this country, the members of the Commission visited medical schools and hospitals in Tokyo and Kyoto, Japan; Seoul, Korea, and the following places in China: Mukden, Peking, Tientsin, Tsinanfu, Hankow, Wuchang, Changsha, Nanking, Shanghai, Soochow, Hangchow, Hongkong and Canton. While the conclusions of this Commission were in harmony with the general plan of work tentatively adopted upon the recommendations of the Commission of 1914, much valuable light was obtained on the more concrete aspects of the work to be done, and a more adequate estimate of the magnitude and the difficulties of the task was made possible. In general, the policy of the China Medical Board may be said to be that of making possible, at the earliest possible date, the assumption by the Chinese themselves of the task of carrying the advantages of modern medicine, both therapeutic and preventive, to the masses of China. In other words, the highest and best function for the Board, as for all foreign agencies for the material and spiritual betterment of China, is that of training leaders, so that the ultimate task shall fall on the Chinese themselves. Not only is it impossible to conceive that an undertaking of such colossal proportions could be accomplished with-

out the development and mobilization of the resources of China to that end, but it is also essential to the success and the permanence of any such work that it shall be done by the people themselves, for themselves, rather than by any outside agency, however large its resources or beneficent its aims.

It is a corollary of the proposition that China must work out its own salvation under its own leaders, that the training of those leaders should be the best that the world affords. The work to be done through the two great schools in Peking and Shanghai will challenge men of the highest character and scientific attainments, thoroughly imbued with a missionary spirit; and the best will be none too good. At a time when the medical schools of this country are having difficulty in finding adequately trained men for professorships in the various departments of medicine, the discovery and enlistment of capable men for service in China is by no means a simple matter. There is reason to believe, however, that the growing demand for well-trained men as teachers of medicine both at home and abroad is attracting a larger number of men to medical teaching as a profession, and it may well prove that the responsibilities which this country has assumed in China will have a stimulating effect at home, to the great advantage of medical education generally.

INVESTIGATION OF INDUSTRIAL RELATIONS

The investigation of industrial relations has been continued during the past year by Mr. W. L. Mackenzie King. Mr. King had been engaged for some time upon bibliographical work in an attempt to chart the field of industrial relations in a manner that would give more intelligent direction to such intensive studies as he might later pursue. Early in the year, however, he decided to utilize the industrial disturbance in Colorado as a means of coming in close contact with the complicated factors of industrial unrest.

Shortly after his arrival, an application was made to the Rockefeller Foundation, with the approval of the Governor, for aid in relieving the great distress that existed in the mining regions of Colorado as a result of unemployment growing out of the recent industrial disturbance. The Foundation took advantage of Mr. King's presence in Colorado to secure his coöperation and advice in dealing with this matter. An appropriation of \$100,000 was made to be expended under the direction of the State Committee on Unemployment and Relief, and a plan was devised by the Committee in collaboration with Mr. King, whereby a large amount of labor was utilized in building roads and other public works, payment being made in the form of orders on local dealers for the ordinary necessities of life. The entire sum ap-

propriated was thus expended to advantage and went far to relieve a condition of great suffering and hardship.

Responding to an invitation from the Colorado Fuel and Iron Company, Mr. King then gave the benefit of his knowledge and experience to the officers and employees of the company in perfecting a plan of industrial representation, whereby employees were to be represented, along with company officials, on joint committees and at district conferences and other meetings. Provision was made by the plan for quick and easy access on the part of the employees, through their representatives or in person, to officers of the company with respect to grievances; arrangements were set up for the prevention and settlement of industrial disputes by voluntary conciliation and arbitration; social and industrial betterment policies were adopted and definite terms and conditions of employment were secured.

While not claiming for this plan any finality as an adjustment of the relations of capital and labor, it is not too much to say that it has lessened many of the occasions for misunderstanding, has proved a means of adjusting grievances and has created a degree of good will, which warrants the hope of further progress.

Mr. King resumed his studies at Ottawa after the adoption of the plan of industrial representation in Colorado, and hopes within a few

months to have an outline of industrial relations in such a form as to provide an effective basis of preliminary consultation with authorities in the various aspects of the labor problem.

MENTAL HYGIENE

As fields for practical work in mental hygiene become more clearly defined it is apparent that in this important department of public health opportunities for new and extremely useful kinds of humanitarian service can be found. At the same time participation in such work will provide a means through which many social and economic problems depending wholly or in part upon mental factors can be better understood and more effectively dealt with. In the report of the Foundation for 1913-14 it was stated that the most promising avenue for promoting mental hygiene seemed to be offered by the National Committee for Mental Hygiene, an organization which had already done fruitful work in this field. Accordingly, the services of Dr. Thomas W. Salmon, who was appointed a member of the staff of the Foundation, were placed at the disposal of the National Committee for two years. That organization had prepared the way for actual surveys of the provisions existing for the public care and treatment of the insane and feeble-minded in the different States, by a careful study of methods of administration and supervision and of the

legal provisions which govern the treatment of mental diseases and mental defects. The practicability of conducting such surveys and the effects upon standards of care and treatment which might be expected to result from them had already been demonstrated by studies undertaken by the National Committee in Wisconsin and South Carolina and by affiliated State societies in Connecticut and Pennsylvania. In the hope that the extension of such surveys to a number of States would go far toward permitting the insane to share more equitably in the great advances which have characterized the treatment of all classes of the sick during recent years, an appropriation was made which will enable the National Committee to complete surveys in at least sixteen States before the close of 1916. Already surveys have been completed or are under way in Arkansas, Louisiana, Tennessee and Texas and plans are being made to inaugurate others early in 1916 in California, Illinois, Missouri, Indiana, North Carolina, North Dakota, Rhode Island and the District of Columbia. Invitations have been received from other States and arrangements will be made as rapidly as possible to begin additional surveys. Such invitations come from governors, State boards of control or supervision, universities, State societies for mental hygiene and other organizations interested especially in the welfare of the insane and the

mentally defective or in the general advancement of medicine or philanthropy. At the outset some doubt was felt whether the examination by an entirely unofficial agency of such an admittedly governmental function as the care of the insane would always be welcome. It has been particularly gratifying, therefore, to see how quickly the advantages to be gained from a critical but constructive study of this problem by impartial and expert psychiatrists have been recognized and how eagerly such surveys are being sought. The obligation of entrusting this work only to the best qualified men obtainable has been fully recognized by the National Committee and all the resources of that organization—in information, advice and expert guidance—will be placed at their disposal. These surveys will, in every instance, take into consideration not only the institutional phases of the treatment of mental diseases and mental deficiency but the community phases upon which, as it is coming to be seen, depend in a marked degree our hopes of dealing with the really staggering problem of mental diseases more successfully in the future than we have done in the past. The studies already undertaken have brought to light nothing so pathetic as the survival of almshouse care of the insane in this age of enlightenment. It is becoming evident that this most painful phase of American community life is making its last stand be-

hind popular ignorance of its existence, or of its actual characteristics; and it does not seem too sanguine to hope that the entire elimination of almshouse care of the insane will be one of the happy results of these surveys when they have been made in all the States.

Although work in behalf of the insane was the first task in mental hygiene to be undertaken by the Rockefeller Foundation, opportunities for aiding in the important general movement to deal more effectively with mental deficiency have received careful study during the year. Numerous opportunities to aid in this movement have been presented, but it has been felt that more favorable points of attack exist than most of those which are being brought to the attention of the Foundation. To determine some methods of approach which will give access to fundamental factors seems to be the most useful service which can be rendered at the present time.

PROMOTION OF GOVERNMENTAL RESEARCH

As has been remarked above, the aggregate amount of money which the community is spending for the welfare of its members through public and private agencies is so prodigious that the resources of any single individual or agency are relatively insignificant. If, however, comparatively small funds are used to promote the discovery or application of sound

principles, ideas, or methods in such manner as to affect favorably the use made of the general resources, the return upon the investment in terms of human welfare may become very great. In no field of activity has this truth become more apparent than in that of governmental efficiency. Governmental expenditure lacks the checks and safeguards which the ordinary conduct of business affords through competition and the necessity of making a profit. While many of the functions of government are not susceptible of test and measurement by mercantile standards, there is a wide field of governmental business management within which the ordinary tests of economy and efficiency may be applied. The construction and maintenance of public works, methods of administration and accounting, and many of the processes of purchase and sale are reducible to a strictly business basis and should be so reduced in the public interest no less than in that of the taxpayer as such.

The New York Bureau of Municipal Research has been the recognized pioneer in this field of public service, and the fruits of its work are discernible not only in the improvement of the business administration of the City of New York but also in the creation of similar bureaus of research in many different cities as well as the Institute for Government Research recently incorporated in the District of Columbia.

The progress of the municipal research movement in the United States has been marked by two distinct kinds of service. The first, on which the most emphasis has hitherto been laid, has been that of coöperating with government officials in the setting up of better methods of accounting and business administration. The spirit and method of this work should be as far removed as possible from what is commonly known as "muckraking." While it may happen that the study of actual conditions will reveal gross inefficiency or even corruption, the dominant motive is not, or should not be, that of making personal attacks or sensational revelations, but rather that of effecting improvement. The second kind of service is that of making scientific studies of the processes of governmental administration with a view to discovering or inventing the best methods and of standardizing them in such a way as to make them available for general use. The Foundation has made substantial appropriations during the past year for both kinds of service. It has contributed to the funds of the New York Bureau of Municipal Research for carrying on the regular work in the government of New York City and for studies in the government of the State of New York. In addition to these contributions, the Foundation has appropriated \$50,000 for the promotion of certain fundamental scientific studies, the results of which

are expected to benefit governmental administration generally, whether national, state or local. Among these studies the following are the most important:

(1) Methods of Budget Making and Financial Administration ; (2) Standards and Practices Evolved for the Improvement of the Civil Service ; (3) Provisions for Pensions and Retirement Allowances ; (4) Methods of Public Accounting ; (5) Highway Legislation.

These studies have been conducted by Dr. Frederick A. Cleveland, the Director of the New York Bureau of Municipal Research, under the general supervision of a special committee appointed by the Rockefeller Foundation. The publication of the results of several of these studies is expected during the ensuing year.

WAR RELIEF

The Rockefeller Foundation continued during the past year to appropriate funds for the relief of suffering caused by the war. The appended report of the War Relief Commission describes in detail the various activities of the Commission and the appropriations made upon their recommendation. It will be noted that the attention of the Foundation has been centred chiefly on the relief of non-combatants, especially those who by race or nationality have been only secondarily if at all involved in the main antagonisms of which the war is the deplorable

expression. While it is true that international law attributes the quality of neutrality to the succor of those wounded in battle, and that such service is both permissible and admirable, it has seemed to the Trustees of the Rockefeller Foundation that an agency which centered its attention on measures of civilian relief sanctioned by the belligerent nations of both groups, would be in a position to perform the most effective service for the millions of non-combatants whose sufferings have constituted one of the most terrible as they have been perhaps the least definitely anticipated results of the war. The relief of the civilian inhabitants of Belgium, Poland, Serbia, and the Ottoman Empire by American agencies has been conditioned very largely upon their coöperation with the governments of both the Central Powers and the Allies; and all that these American agencies have been able to do has met but a fraction of the need.

There is, indeed, one branch of relief work aided by the Foundation which is for the benefit of combatants, but this too is one which commands the sympathy of both belligerent groups, namely, the work of the International Committee of Young Men's Christian Associations in the military and prison camps of the contending nations. The task here has been to arrest and counteract the demoralizing tendencies of enforced idleness in camp which threaten to

prove among the most far-reaching of all the malign influences of the war. This important work has been well managed, has won the confidence of the governments concerned and promises to make one of the most creditable pages in the record of American relief work.

Early in the past year the Commission for Relief in Belgium perfected its organization in the United States for the purchase and transportation of supplies for Belgium, and the Foundation appropriately relinquished these functions which it had temporarily assumed in the emergency existing during the first months of the war. In response to a special appeal to the American public the Foundation made a contribution of \$200,000 to the Commission for Relief in Belgium for the purchase of materials to be made into clothing for Belgians, by Belgian labor. The Foundation also assisted the Commission by providing for a few months in Rotterdam an organization for the assorting and re-shipping of the vast quantities of clothing that had been contributed from various parts of the world. For the relief of the large numbers of Belgian refugees in Holland the Foundation organized sewing classes employing several thousand women, and provided materials and machines adequate for the manufacture of clothing then sorely needed by the refugees. This work was administered with the cordial coöperation of the Government of the Netherlands and

was later carried on under its direct auspices. In England the Foundation continued its contribution toward the support of professors from Belgian universities in order to enable them to continue their studies.

The American Red Cross, with the coöperation of the Foundation and that of medical agencies sent from Great Britain, France, and Russia, undertook during the spring and summer of 1915 the formidable task of combating an epidemic of typhus fever in Serbia. Dr. Richard P. Strong, who headed the American Red Cross mission, became the director of an international board organized under the authority of the Serbian government, and important administrative, medical, and police measures, calculated to discover the incidence of the disease and to stop its spread, were promptly taken. The subsidence of the epidemic was doubtless materially accelerated by these measures, and, what promised to be of even greater importance, the local authorities and the common people were prepared to defend themselves more effectively against subsequent outbreaks. After the epidemic was at an end the Rockefeller Foundation appropriated the funds necessary to continue the work of sanitation for a period of six months, but this work was interrupted in October, 1915, by the occupation of Serbia by the Central Powers. Fortunately Mr. Stuart, the engineer in charge, was permitted by the new military authorities to

direct his energies to relief work, and though laboring under great difficulties due to the exigencies of the military situation, he was able to make good use of the funds placed at his disposal by the American Red Cross and the Rockefeller Foundation.

The report of the War Relief Commission indicates that great importance has been attached by the Foundation to the relief of suffering in the Ottoman Empire and in the adjacent portions of Russia and Persia to which hundreds of thousands of Armenian and Syrian refugees had fled. In all these areas the need has been of a sort that could be met in large measure by the local use of funds, first for the purchase of food, clothing, and shelter, and later for the provision of live stock, seed, and farming implements. Fortunately, both in Turkey and in the neighboring territories, trustworthy American agents having the respect of the authorities were on the spot and the funds provided have been applied in a manner justifying the confidence of contributors to the American Committee for Armenian and Syrian Relief, through which most of the Foundation gifts have been made.

In Poland it has unhappily proved impossible for outside relief agencies to organize and direct their efforts on a scale commensurate with the enormous need. Much has been done by the American public through various committees, and especially through the American Jewish

Relief Committee, so far as gifts of money could be made effective, to mitigate the terrors of famine and exile, but the one outstanding need of some neutral agency to import food and clothing under suitable guarantees so as to make possible the feeding of whole communities numbering millions of people, as in Belgium, has not yet been met in spite of the prolonged efforts that have been made. Meanwhile, hundreds of thousands of men, women, and children have perished.

Through the Rockefeller Institute for Medical Research the Foundation has continued its support of the surgical laboratory maintained in connection with a military hospital at Compiègne under the direction of Dr. Alexis Carrel. The purpose of this laboratory has been to improve existing methods of treating wounds, especially those which are infected, with a view to saving life and limb and accelerating the process of healing. Results of undoubted significance have already been obtained with the collaboration of Dr. Henry D. Dakin who has dealt with the important chemical aspects of the problem, and these results have been made generally available by publication.

In concluding his report on the activities of the War Relief Commission the Chairman acknowledges its indebtedness to the Department of State, its representatives abroad and the many governmental officials and private indi-

viduals concerned with relief measures in the countries visited upon whose uniform courtesy and helpfulness the work of the Commission has at all times depended.

APPENDED REPORTS

Fuller details of the work of the Rockefeller Foundation during the past year may be found in the accompanying reports of the subsidiary organizations, namely, the International Health Commission, the China Medical Board, and the War Relief Commission. In the Treasurer's Report will be found the usual summaries of the financial operations of the Foundation and a complete list of gifts and pledges made during the year.

JEROME D. GREENE,
Secretary.

INTERNATIONAL HEALTH COMMISSION

Report of the Director General

INTERNATIONAL HEALTH COM- MISSION

Report of the Director General

To the President of the Rockefeller Foundation:

Sir:

I have the honor to submit herewith my report as Director General of the International Health Commission for the period January 1, 1915, to December 31, 1915.

Respectfully yours,

WICKLIFFE ROSE,
Director General.

INTERNATIONAL HEALTH COMMISSION

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* Members of the Executive Committee.

I. GENERAL SUMMARY

The resolutions creating the International Health Commission assigned to it two tasks: to coöperate with the United States and other countries in measures for the relief and control of uncinariasis, or hookworm disease, as opportunity offers; and so far as practicable to follow up the treatment and cure of this disease with the development of agencies for the promotion of public sanitation and the spread of the knowledge of scientific medicine. Up to 1915 the Commission had confined its efforts almost wholly to the relief and control of hookworm disease; during the year just ended this work has been extended and certain new lines of activity have been undertaken.

In the United States measures against hookworm disease were carried out during the year in coöperation with the states of Alabama, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia; in other countries in coöperation with Government in Antigua, British Guiana, Dutch Guiana, Grenada, St. Lucia, St. Vincent, and Trinidad, in the West Indies; in Costa Rica, Guatemala, Nicaragua, and Panama, in Central America; and in Egypt and the Federated Malay States, in the Orient; arrange-

ments have been made for inaugurating the work in the Seychelles Islands and in Salvador; an infection survey is being made in British Honduras to determine whether the work of relief and control should be undertaken there; and an investigation of the prevalence of the infection among the agricultural population of Hunan, China, is being carried out under the direction of Dr. Hume, of the Yale Medical School of Changsha. The Commission is prepared to aid in extending this work to other countries as conditions invite.

In the Federated Malay States hookworm infection is known to be prevalent, but to arrive at a just estimate of its importance as a disabling disease has been made extremely difficult by the prevalence of a severe form of malaria and the mingling of a number of different nationalities. A scientific commission has been appointed and is now on the ground carrying out an investigation to determine whether the effects of hookworm disease in that country are sufficiently serious to justify systematic effort for its relief and control.

Preliminary arrangements have been made for a survey to determine the feasibility of undertaking at this time the eradication of yellow fever, and for experiments to test the practicability of controlling malaria. Attention has been given to the collection of information relating to medical education and to agencies for

the control of disease in many countries. In coöperation with Government in the Philippine Islands a hospital ship is being provided for the inhabitants of the Sulu Archipelago. More detailed information concerning each of these activities is given in succeeding pages.

I

MEASURES AGAINST HOOKWORM DISEASE

During the year the International Health Commission has coöperated with ten Southern states and with thirteen foreign countries in work for the relief and control of hookworm disease. The director of the work in each of these states and countries has prepared a detailed report, usually at the end of each quarter, of the work under his supervision, and by the courtesy of the several state and national departments of health, the Commission has been kept in intimate touch with what was being done in each field of operation. In summarizing and reporting the methods and progress of the work in all these countries it is not intended to imply that the work is being done by the Commission. The Commission does not undertake on its own account the relief and control of hookworm disease in any country. If the work is to be successful the state or country in which the infection exists must assume the burden of responsibility. The Commission has had the

privilege of sharing in the work by making small contributions toward its maintenance and by lending a few well-trained men to aid in its organization, but in some countries even the larger share of the financial burden is borne, and in all cases most of the men are supplied, by the countries themselves. In the Southern States the Commission is now contributing about one-third of the amount required to maintain the work. The most important and most encouraging feature of the undertaking is the initiative and responsibility assumed by national, state, and local authorities.

The control of hookworm disease is an undertaking of enormous magnitude, and can be accomplished only by permanent agencies working over a long period of time. The disease is found in practically all countries which lie in the tropical and sub-tropical zones, extending from parallel 36 degrees north to parallel 30 degrees south. More than one-half of the population of the globe live in this area. The prevalence of the infection and the severity of its effects as a disabling disease vary greatly from country to country and from locality to locality within a given country. In some countries the percentage of persons infected is high, while the disease is relatively mild in form; in other regions these conditions are reversed. In general it may be said that where racial immunity does not enter as a determining factor, the disease assumes its

most virulent form in those countries in which it is also the most wide-spread. Of 1,458,483 persons taken at random and microscopically examined during the period from January 1, 1910, to December 31, 1915, in countries where the work has been in progress, 531,749, or 36.5 per cent, have been found infected. In these countries the infection ranged from a minimum of 27.3 per cent to a maximum of 83.6 per cent of the population examined. In Ceylon, where the work is just getting under way, microscopic examination shows that more than 96 per cent of the entire population on certain large rubber estates are infected, and, as would be expected where the percentage of infection runs so high, the results in the form of anemia and impaired working efficiency are in many cases extremely severe.

In no country is the death rate ascribed directly to hookworm disease particularly high; this disease is never spectacular, like yellow fever or plague or pernicious malaria. It is the greater menace because it works subtly. Acute diseases sometimes tend to strengthen the race by killing off the weak; but hookworm disease, working so insidiously as frequently to escape the attention even of its victims, tends to weaken the race by sapping its vitality. Persons harboring this infection are more susceptible to such diseases as malaria, typhoid fever, pneumonia, and tuberculosis, which prey upon

lowered vitality. But even more important than this indirect contribution to the death roll are the cumulative results,—physical, intellectual, economic, and moral,—which are handed down from generation to generation through long periods of time.

The disease is caused by a small parasitic worm (*Uncinaria*, or hookworm) which attaches itself to the inner lining of the intestine and there sucks and poisons the blood of its victim. Thousands of these parasites may live in the intestine of a single person; in one case by authentic count more than 6,000 hookworms were passed by a patient as a result of treatment. The females are remarkably prolific egg-producers. So long as they remain in the intestine these eggs do not hatch, but when passed from the bowels and deposited on the ground under proper conditions of air, heat, and moisture, they hatch within the brief space of from twenty-four to forty hours. The young hookworms, which are too small to be seen with the naked eye, may live on and near the surface of the ground for many months. So long as they remain in the soil they remain microscopic in size. They enter the human host by boring through the skin of the bare feet or hands or other portions of the body which are brought into contact with soil in which they exist, and pass into the circulating blood. Finally they reach the small intestine, where they attain the adult stage, proceed to prey

upon their host, and begin anew the life-cycle here outlined.

Measures for the control of hookworm disease spring directly from the life-history of the parasite, and theoretically are definite and simple. The disease may be controlled by putting a stop to soil contamination. The parasite does not multiply in the body of its human host; every hookworm in the intestine entered the body from the outside and came from polluted soil, where this infective form hatches and thrives. With proper disposal of human excrement to prevent contamination of the soil the hookworm would become extinct. In practical operation, however, this resolves itself into a sanitary problem of the first magnitude. Regulations designed to prevent soil pollution cannot be made effective by sheer compulsion; they must remain in large measure ineffective until the people have been shown the dangers involved and have been brought to the point of helpful coöperation.

Theoretically, the disease may be brought under control by curing the infected persons. Every embryo in the soil was hatched from an egg which came from the intestine of an infected person. If all carriers were cured and kept cured for a year the soil within this time would become sterile and the parasite would be extinct. In practice it is extremely difficult when dealing with large populations to carry this measure to

completeness. Experience has demonstrated, however, that by treatment of infected persons a large measure of control may be achieved.

In the work to which the Commission gives aid these two measures are combined. The examination and treatment of infected persons is well worth while even if considered merely as a means of relieving suffering and inefficiency. As a control measure it is indispensable, in that it affords the most effective means of educating the people and thus making it possible to carry into effect the sanitary measures upon which Government must depend for the final control of the disease.

Working Arrangement with Governments

In most of the countries where the Commission shares in work for the relief and control of hookworm disease, the plan of operations provides for two staffs: the one toward the maintenance of which the Commission contributes devotes itself to the work of examining, treating, and educating the people; the other, which is maintained by Government, devotes itself to bringing into operation and maintaining the necessary sanitary measures to prevent re-infection. This has proved highly satisfactory as a working arrangement. The two staffs work in complete harmony under the general supervision of the department of health as two parts of one working machine, but there is a distinct

advantage in their operating and being recognized by the people as separate organizations. The one is essentially a temporary organization, the other is permanent. By being recognized as separate, the former finds it possible to secure the utmost good-will of the people, upon whose coöperation its work of examining, treating, and teaching depends, and to have this coöperation without the prejudice sometimes arising from the work of the sanitary officers, who must occasionally cause resentment by their efforts to compel the people to improve the sanitary conditions of their premises. The temporary organization, because of its having the undisturbed confidence and good-will of the people, finds it possible while examining and treating them to educate them to a definite understanding of the sanitary needs, and thereby to make it possible for the sanitary organization to carry out its work with a minimum of compulsion. This working arrangement has the additional advantage of providing opportunity for Government to build up its permanent sanitary organization gradually, as the work advances from area to area and as a sustaining public sentiment is developed. The results thus far in the direction of developing sanitary organizations, trained to do at least one bit of definite work, have more than justified expectations.

Working Methods

Working methods are varied somewhat to suit local conditions, but in all countries the end being sought is the same; and in all countries the people are being examined, treated, and taught, and effort is being made to bring into operation such permanent system of sanitation as will in the end bring the disease under complete control. In the progress of the work there have developed two distinct methods of attack by which the control measures are applied. The one is known as the dispensary plan, and the other, which has come as a later development, as the intensive plan. In the one case the work of examining, treating, and educating the people centers around the free traveling dispensary, and has the advantage of covering large areas and of reaching large numbers of people in a comparatively short time; in the other, the whole work, including sanitation, is limited for a given time to a small area, and has the advantage of greater thoroughness in every detail.

Work by the Dispensary Plan

The dispensary plan of attack for the relief and control of hookworm disease was first employed on a large scale in Porto Rico by the Porto Rico Anemia Commission; and there it demonstrated its usefulness in bringing prompt relief to something more than 300,000 sufferers and in giving to the people of that island and of

other countries a demonstration so convincing that its influence is still effective in the work now in progress around the globe. Where this plan is followed, dispensaries visit at regular intervals the towns and villages most convenient to the people and offer free examination and free treatment to all who apply. The essentials of a dispensary staff are a physician who has been definitely trained in all details of the work, and a corps of assistants—usually lay assistants—who have been trained to proficiency as microscopists in examining fecal specimens for intestinal parasites. The staff is equipped with microscopes, specimen containers, hemoglobinometers, the necessary drugs, record forms, camera, lantern and slides, charts, leaflets, and a fund of exhibit material for effective educational work. The dispensary as a working agency does not undertake to examine the whole population, but only those who apply; it dispenses the necessary drugs to those who desire treatment, but does not administer treatment under direct supervision; it cannot follow up its first treatments with continued re-examination and re-treatment until cure has been demonstrated; and it does not remain in one place long enough to effect conspicuous results in sanitation which it may measure and record as definitely accomplished.

But experience has shown that the dispensary is a most effective means of bringing speedy re-

lief to a large number of people distributed over wide areas, and that it is equally effective as an agency for educating the people *en masse* and creating a sustaining public sentiment which makes possible the more intensive type of work which may follow. By the dispensary plan of work, within little more than three years practically the whole infected area of eleven Southern states was covered; the press, the schools, the practicing physicians were enlisted; treatment was given by the dispensaries and practicing physicians to about 750,000 persons; and 20,000,000 people were educated as to the importance of the disease and the methods of its relief and control.

Some work of this type has been done during 1915 in the states of Alabama, Georgia, Kentucky, Tennessee, and Texas in the United States; in Grenada, St. Lucia, and Trinidad in the West Indies; and in Costa Rica, Guatemala, Nicaragua, and Panama in Central America. The official working forces operating under this plan have microscopically examined during the period from January 1, 1910, to December 31, 1915, 1,390,040 persons; have found 501,094, or 36 per cent of these, to be infected; and have given treatment to 565,080 persons.¹ (For results in detail see Tables III and IV, pages 82 and 83.)

¹ Some persons were treated on clinical diagnosis.

Work by the Intensive Plan

The fight against hookworm disease in the mines of Hungary and of Switzerland tends to show that its complete control within a given area is a possible achievement. Under the intensive plan of work, as it is being carried out in the United States and in other countries, effort is made to approximate, as nearly as practicable, complete control of the disease within the area of operations. The plan was first tried out in part on Knott's Island in eastern North Carolina, and later was put to the test in more thorough detail in the Peter's Hall district, British Guiana. The success of this experiment, as carried out in British Guiana and in some of the states, demonstrated the feasibility of the undertaking and established the intensive plan of work as the prevailing type. Work of this type has been in progress during the year in the states of Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia; in the Colonies of Antigua, British Guiana, Dutch Guiana, St. Lucia, St. Vincent, and Trinidad; and in most of the other countries, where the dispensary plan has been followed, the work has been growing more and more intensive in character.

Experience during the year has demonstrated that the intensive plan of work is feasible under a great variety of conditions, and strongly suggests its applicability under all conditions, irre-

spective of race, creed, occupation, environment, distribution of population, or degree of infection. Successful work has been done in areas where as many as five different languages are spoken, and where East Indians, Negroes, Chinese, Portuguese, and creoles of English, French, and Spanish blood, with a great variety of mixed breeds, make up the population. The distribution of population has varied from the densely inhabited villages of British Guiana and Trinidad to the scattered and almost inaccessible rural homes of St. Vincent, where in one instance, with a donkey to ride, only two homes could be visited in a day. One medical officer in charge states it as his conviction that the intensive plan can be made to work in any territory where people and hookworm infection are to be found. The determining factor would seem to be whether the need of control justifies the cost. But even in St. Vincent, with its sparse population and difficulties of travel, the per capita cost has not been prohibitive.

The territorial unit of operations under this plan may be a county, or it may be a small, well-defined community containing from 1,000 to 15,000 people. For purposes of convenience and efficiency in practical administration, the larger unit area is divided into a number of small districts, and to each of these districts is assigned one field worker who is held responsible for results within this area. The work to be carried

out involves: mapping the district, locating roads, streams, and houses; taking a census of the population, numbering the houses in which the people live, recording name, age, sex, race, and post-office address; making microscopic examination of the entire population; administering treatment to all persons found to be infected; and continuing treatment and microscopic examination of each patient until cure is effected. While this work is in progress the people are taught, by illustrated lectures, by leaflets and charts, and by personal, concrete instruction in a house-to-house visit, the essentials of hookworm disease and its control.

The plan of work as conducted in those countries in which the local government is undertaking on an adequate basis to prevent re-infection, has the advantage of being definite and thorough and of giving one a sense of accomplishment closely approximating completeness. The director of the work does not have to guess at the prevalence of infection in a given community. He sends a nurse with specimen containers to every home, gets a specimen from each individual, has these specimens examined under the microscope by a competent staff, and by this examination locates the carriers of infection. The treatment of the infected is equally definite. The medical officer has in thymol a specific for the parasite. He sends a nurse to the home of each infected person to

administer the treatment, and follows the successive treatments with microscopic re-examinations until a cure has been demonstrated. The sanitary work is as thorough as that of examination and treatment. The sanitary problem of the community is determined by a house-to-house survey of latrine conditions, and the object in sanitation has been accomplished when every house has been provided with adequate latrine accommodations and when a system of inspection has been established to guarantee their proper use.

The sanitary work, which must be kept under a system of permanent inspection, is carried out by permanent government agencies. Where no sanitary organization exists the intensive work enables Government to undertake a definite sanitary task on the basis of an insignificant outlay and to develop its sanitary organization gradually, as the work is extended from community to community and as the people are educated to the point of giving willing and intelligent coöperation. The thoroughness and permanency of the sanitary work give one a sense of results that is lasting.

In most communities, as the reports show, the staff does not succeed in examining the total population, nor does it succeed in curing all of those who are infected. This was done on Knott's Island and it could be done in other communities. But there is a point beyond

which it is not feasible to carry the work of examination and treatment. In Trinidad, 91.5 per cent of the total population of the areas in which intensive work was conducted were examined, and 90.8 per cent of the infected were put under treatment; of these, 14.6 per cent removed from the area before treatment was completed, and 74.7 per cent were known to be cured. In British Guiana, 94.4 per cent of the population within the areas of operation were examined; of these, 62.3 per cent were infected; 90.6 per cent of the infected were treated; and 84.3 per cent of those under treatment were cured. In St. Vincent, 99.9 per cent of the people within the areas were examined; 94.9 per cent of the infected were treated; and 84.9 per cent were cured. It may be reasonably expected that the slight amount of infection left in the community will be eliminated by means of sanitation. (See Table VI, page 86.)

The economic value of systematic work for the relief and control of hookworm disease is indicated in a report issued by the Immigration Department of Trinidad, in which it is stated that where the indentured laborers on estates have been treated for the disease, their efficiency, measured in hours of labor performed, has increased from 20 to 30 per cent. The Department also reports that on one estate, sanitary reform and treatment of persons have reduced by two-thirds the number of patients admitted

to the estate hospital. Similar results are exhibited at the Orphanage and Industrial School at Tunapuna, where the number of admissions to the hospital dropped to one-third immediately following the elimination of hookworm infection, and where during the last two months of the year only three patients were admitted to the hospital, as against a monthly average of forty admissions for the previous four years.

The Latrine Problem

Soil pollution is largely responsible for the spread of typhoid fever, diarrhoea, dysentery, intestinal parasites, and similar diseases. It is entirely responsible for the transmission of hookworm infection and is therefore directly connected with the work.

Soil pollution seldom occurs in cities and towns where there are modern water-closets available for the entire population. Many rural communities do not have latrines, which means that human excrement is deposited on the ground, and through flies, insects, or direct contact, infected material finds its way into the bodies of other human beings. This is responsible for thousands upon thousands of cases of illness and death each year. Curing persons of hookworm infection is of little value unless steps are taken to prevent their re-infection. The extent and seriousness of the problem may be seen from the following figures. A sanitary survey was made

in 770 counties in eleven states with a view to ascertaining the conditions at the homes which are responsible for the prevalence of hookworm infection. In this survey 287,606 farm houses were examined, and of these 142,230 were found to have no latrine of any kind. This means that at nearly half of the homes soil pollution invariably prevailed. At a very large number of the homes reported as having latrines, they were of the open-back type which does not prevent soil pollution. At only six-tenths of one per cent of the homes were the provisions for the prevention of soil contamination reported by the state authorities as satisfactory.

In the intensive community work which is now being carried out in the United States and in other countries, chief emphasis is being given to improvement in sanitation. The people are being taught the dangers of soil pollution and are being urged to install some type of latrine as a preventive measure. The lesson is driven home by insistent repetition in a house-to-house canvass; and local carpenters are employed to assist in construction. As a result of this effort latrines are being installed in large numbers. (See Tables IX and X, pages 91 and 92.) In many communities such provision has been made at every home while the work was in progress; and in other communities where this feature of the work is left uncompleted, it is continued by local effort as a result of the momentum which

has been given it. It seems not unreasonable to expect that the systematic effort which these states and countries are now making to control hookworm disease and other enteric diseases will continue until sanitary conditions at rural homes are satisfactory.

But from the success of the present effort in inducing the people to provide and to use some form of sanitary arrangement to prevent contamination of the soil arises a new problem which cannot be ignored; namely, the problem of the relative efficiency or inefficiency of the various types of latrines that are being installed. In view of the fact that practical measures are being adopted and that state and national departments of health are committing themselves to policies to be carried out on a large scale, the so-called "latrine problem" becomes a matter of serious concern. The International Health Commission is not prepared to advise as to the type of latrine to be installed. The local department of health in each state and country is responsible to the people for all sanitary measures carried out under its direction, and must therefore use its own judgment as to the type of latrine which it recommends. In the community work which is now under way in the United States there is considerable diversity of views and of policies. The Kentucky State Board of Health, for example, is committed to the so-called Kentucky type of privy (a con-

crete septic tank), and this alone is being installed in the community work in that state. In Louisiana both the L. R. S. type (barrel privy designed by Lumsden, Roberts, and Stiles) and the Kentucky type are being installed. In other states, as in Virginia and Mississippi, the state departments of health recommend a variety of types, including the Kentucky, the box, the barrel, the pail, and the pit, the type adopted being determined by the conditions which prevail in the communities where the work is done. In these states the pit latrine is the one most frequently installed.

Each of these latrines has its advantages and disadvantages; but in the light of present knowledge one is not prepared to say of any of them that it meets all the requirements of the situation. The Kentucky privy and the barrel privy under properly controlled conditions embody the principles of the septic tank. Their cost is a hindrance to their general use in rural communities under present conditions in these states. Careful study of those that are in operation should be made to ascertain whether the effluent is safe under the conditions of family and community use. The pail under controlled conditions, with incineration of its contents, is safe; but in practical experience in rural communities it is found that it frequently becomes offensive and falls into disuse; that it is extremely difficult to keep the boxes fly-proof and

to have the pails properly cared for. When the pails are emptied the content is buried in the soil, thus involving a series of conditions and possible consequences which call for careful investigation in the field under the conditions of actual experience. The pit privy which is being installed in large numbers in some of the states has the advantage of being inexpensive, simple in construction, and almost automatic in operation. It is coming into use on a large scale mainly for the reason that it is found to be feasible, that the people can be induced to install it, and to use it. So far as hookworm infection is concerned, it seems to be reasonably efficient. But it involves a large accumulation of excreta under ground, with whatever this condition implies as to dangers of water contamination by seepage and underground drainage.

Here, then, is the problem: to find a satisfactory method for the disposal of sewage at the farm home; one which the people in rural communities may be brought to adopt and to carry out, and one which will prove to be safe in actual experience under the conditions which prevail in these communities. The intensive community work now under way is being impelled and guided by the conviction that out of the growing volume and variety of experience which is being gained, there will emerge by gradual evolution a form of adjustment that will be satis-

factory. But in order to hasten this development and to avoid serious error in the meantime, this whole experience should be subjected to critical examination. In what has already been done there is sufficient volume and variety of experience to afford a satisfactory basis for a critical study of the advantages and disadvantages or relative efficiency of the various methods employed for the disposal of sewage at the rural home. The state departments of health are eager to have this study made, and offer co-operation in carrying it out; the Commission is prepared to coöperate by supplying the necessary funds for the work; working plans are being matured; the results of the many scientific studies that have been made of different phases of the problem are being summarized, and it is hoped that the investigation may be under way within the coming year. The work, if undertaken, will need to extend over a long period of time and to cover a considerable area of field work in order to test experience under all seasons and under a sufficient variety of conditions. The aim will be to subject present procedures to scientific examination with a view to pointing the way, if possible, to a method for the disposal of sewage at the country home that will be safe and that will be workable under prevailing conditions.

Hookworm Disease Exhibit at San Francisco

Early in the year 1915, the International Health Commission installed an exhibit on uncinariasis in the Palace of Education at the Panama-Pacific International Exposition, which was held at San Francisco from February 20 to December 4, 1915. The most valuable and most impressive feature of the exhibit was a series of glass and wax models prepared by experts of first-rate ability. A series of eleven models in glass exhibited on a scale highly magnified the anatomical structure and life-history of the parasite. The artist had spent months in study with the microscope and succeeded in reproducing microscopic detail by means of colored glass on a scale which the layman could see and understand.

A series of twelve models in wax and in plaster and wax exhibited in most lifelike and impressive form the effects of uncinariasis on its victim. The artist and his staff of artisans went to the Southern States, where they worked in the heart of an infected region amid surroundings which made it possible to reproduce details true to life. Afflicted boys were brought in and casts—in many cases complete body casts—were made from these subjects.

A series of large transparencies; a series of framed photographic enlargements; and about 100 photographs conveniently mounted on rotating wings, showing individuals and families

afflicted with the disease, dispensaries in operation for the treatment of the people, and the physical improvement of individuals and of families after cure, served to portray in accurate and convincing form the conditions as found in heavily infected regions in the Southern States, and the work which is being done for the relief and control of the disease. The same story was told by means of a stereomotorgraph, electrically operated, which automatically threw on a screen a series of colored slides, each bearing its own legend. And these were supplemented by charts, maps, and exhibits in three dimensions. Two attendants who had had large experience in the work in Kentucky had charge of the exhibit throughout the nine months of the Exposition; they gave lectures, distributed literature, and operated a laboratory where persons were examined and the technique of microscopic diagnosis was illustrated.

The attendance from the first day was unusually large, making it necessary to double the space originally provided. The exhibit was well received and was awarded a grand prize. At the close of the San Francisco Exposition the exhibit was removed intact to Washington and installed in the Army Medical Museum, where it is open to the public as a permanent exhibit.

Collection of Information on Uncinariasis

The Commission is engaged in collecting information on the subject of uncinariasis, or hookworm disease, in all countries. It is especially interested in the geographical distribution of the disease, the degree of infection in the infected areas, and the methods which are being employed for its relief and control. Considerable information has already been brought together and made available by classification and index. This information is being collected primarily for the guidance of the Commission; it is desired, nevertheless, that the information may be available to all persons who are interested in this subject. The bibliography is far from complete, but such information as has been collected is at the service of persons who may be interested in any particular phase of the subject. Information has been supplied, for example, to corporations which are interested in the control of uncinariasis in mines. The Commission would be glad to establish relations with persons and organizations that may be working in this field in any part of the world, with a view to the exchange of information and of bibliographical or other available material.

II

MEASURES AGAINST YELLOW FEVER

Prior to the work of Reed and the Army Commission in Havana, yellow fever was regarded

as one of the great plagues. For more than 200 years the tropical and sub-tropical regions of America had been subject to devastating epidemics of the infection, while serious outbreaks had occurred as far north as Philadelphia and Boston, and as far away from the endemic centers as Spain, France, England, and Italy.

During this period appalling epidemics swept repeatedly over the West Indies, Central America, and the Southern United States, decimating populations, paralyzing industry and trade, and holding the people of these regions in a state of perpetual dread. It is estimated, for example, that the epidemic which visited the Mississippi valley in 1878 caused 13,000 deaths and an economic loss of more than \$100,000,000 resulting from paralysis of business, and each succeeding summer brought with it the possibility of a repetition of the experience.

The discovery of Reed and his Yellow Fever Commission has made the control of the infection possible. So far as the United States is concerned the fangs of yellow fever have been drawn. Its eradication from Havana removed the chief source of danger. Cases may continue to appear from time to time on the Southern coast, but since the control of the recent epidemic in New Orleans the people of the States have lost their dread of yellow fever as a scourge. In the countries south of the United States, however, it is still the source of constant anxiety. The

coast of Brazil, the Amazon valley, the Caribbean region, and the west coast of South America from Peru to Mazatlan, Mexico, are subject to invasion at all seasons. Throughout this region yellow fever is the subject of constant vigilance on the part of quarantine officers, and is a serious handicap to commerce and to the general economic development of these countries.

Great anxiety is felt throughout the East on account of the possibility of the introduction of yellow fever into that region as a result of the opening of the Panama Canal. The Canal has wrought radical changes in trade relations. Countries and ports between which there had been little or no exchange have been brought into close relation. Pest-holes of infection that have been relatively harmless because of their isolation are now on or near the world's highway of commerce and travel. As early as 1903 Manson called attention to the grave risk of conveying infection to the Far East as a result of the opening of the Canal. Dr. James, of the Indian Medical Service, who was employed by his Government to make a thorough investigation of the subject, reports that the menace is sufficiently great to call for a permanent quarantine force to be maintained in Panama, Hong Kong, or Singapore at the expense of the English colonies in the East, and recommends to the Indian Government a systematic attack on the *Stegomyia* mosquito. It is recognized by sanitarians

that if the infection should once be introduced into the Orient, with its dense population of non-immunes, the ill resulting from it would be incalculable.

Sanitarians hold that the endemic foci are the seed-beds of infection, and that if these seed-beds be destroyed the disease will disappear from all other points. Fortunately, these seed-beds are few in number. There are probably not more than five or six endemic foci all told, so that the problem of eradicating yellow fever reduces itself to the problem of stamping it out at these five or six points. The work done by General Gorgas at Havana and Panama, and by Oswaldo Cruz at Rio Janeiro, has demonstrated that the disease can be exterminated in such endemic centers and has given ground for the belief that its complete eradication is a feasible undertaking.

Acting on this belief by sanitarians that the eradication of yellow fever is feasible, the International Health Commission has undertaken to carry out a preliminary investigation to determine how far conditions warrant and invite further definite activity in this direction. After months of delay due to war conditions, the membership of a Yellow Fever Commission has been practically completed, and it is expected that this Commission, with General Gorgas at its head, will visit the infected regions during the coming year for the purpose of determining

the doubtful endemic centers, and of ascertaining what measures may be necessary and feasible for the eradication of the infection in those communities on which the responsibility for the presence and spread of yellow fever is found to rest.

III

MEASURES AGAINST MALARIA

Because of its wide geographical distribution, its extreme prevalence over vast tropical and sub-tropical regions, where in places it is responsible for more sickness and death than all other diseases combined, and because of its obvious effects in the form of direct financial loss, impaired economic efficiency, and retarded physical and mental development, malaria is to be regarded as presenting the most serious medical and sanitary problem with which we have to contend. It strongly resembles hookworm disease in its wide distribution and in the fact that it is an anemia-producing disease most prevalent among children, and therefore preying upon the race most heavily during the period of physical and mental growth.

This general consideration led the Commission to take up the subject of malaria early in July of the current year, with a view to ascertaining whether the control of this disease might offer a field of service with promise of definite and far-reaching results. The inquiry

covered such phases of the subject as the geographical distribution of malaria, the degree of infection in certain localities in various parts of the world, the significance of malaria as a disabling disease, the principles underlying all control measures, and the methods and results of a large number of systematic efforts that have been made under widely different conditions for its control.

Theoretically, the control of malaria is relatively simple, but as a practical undertaking it has been found extremely difficult. In view of the important interests at stake, however, the International Health Commission is undertaking to carry out an experiment with a view to ascertaining what degree of control may be achieved in our temperate climate within the limits of reasonable expenditure and under the conditions which prevail in typical farming communities in the Southern States. Arrangements have been made to carry out two sets of experiments: one to test the practicability of malaria control by detecting the carriers and freeing them of the parasites; and the other to test the practicability of malaria control by means of a combination of control measures. In neither case is the extermination of mosquitoes by major drainage operations to be undertaken.

The first of these experiments is to be carried out in Bolivar county, Mississippi, under the

administration of the Mississippi Department of Health, with Dr. W. S. Leathers as Administrative Director, and Dr. C. C. Bass, of Tulane University Medical School, as Scientific Director. The field force and the microscopists have been selected and are now receiving their technical training in the laboratory of Tulane University Medical School under Dr. Bass. The second experiment is to be carried out in Arkansas in coöperation with the U. S. Public Health Service, with Dr. R. H. von Ezdorf in charge. The field force is being made up, the budget has been approved, and it is expected that work in the field will be under way by the middle of March or the first of April.

The work undertaken is frankly an experiment; the practical difficulties to be encountered are serious; the future development of the work therefore must depend upon the results of the present undertaking.

IV

MEDICAL COMMISSION TO BRAZIL

In view of its interest in the promotion of public sanitation and the spread of the knowledge of scientific medicine, the International Health Commission is undertaking, for guidance in its present and future work, to secure information on medical conditions in many countries. From British colonies, and from many other countries which have been

visited by representatives of the Commission, considerable information has already been secured concerning medical and public health agencies, and it is expected that these preliminary studies will be followed by more detailed investigation to be carried out on the ground. As a beginning in this direction arrangements have been made to send a special commission to Brazil to study and report on medical conditions and progress in that country. This commission is expected to sail about the middle of January, 1916. Its studies are to cover the ground of medical education, hospitals, dispensaries, prevalent diseases, public health agencies, and sanitary progress. The Government of Brazil extends hearty welcome to the commission and generously offers every facility for the prosecution of its work.

V

HOSPITAL SHIP FOR THE SULU ARCHIPELAGO

For more than two hundred years efforts have been made, principally through the use of military force, to bring the Moros and near-related tribes who inhabit the Sulu Archipelago under the influence of civilization. The military forces of Spain were unable to accomplish this, and similar efforts made by the United States have not met with much greater success. The Sulu Archipelago, composing the southern group of

the Philippines, comprises a large number of small islands. These are inhabited by about 200,000 persons of the Mohammedan faith who lead a nomadic or semi-nomadic life. The Moros since their entry into history have been a people apart. They were the famous Malay pirates that terrorized the Malay seas and devastated the Philippine Islands to the north. Religious hatred and war-like proclivities have separated the Moros politically and socially from the great mass of the Filipinos, who fear them. The Moro is a man of good physique, quick mind, and of active habits, but he has been so alienated from the rest of the world that the benefits of civilization have never reached him. Preliminary investigation shows that the medical needs of these people are great. They suffer from malnutrition and from diseases fostered by filth and negligence. The common diseases are skin diseases in their worst forms, malaria, hookworm disease, dysentery, and some of the other preventable infections.

The Ifugaos, Kalingaos, Igorots, and other human-head-hunting tribes of northern Luzon, were brought to ways of peace largely by the contact established through medical relief. Similar work has been recently undertaken among the Moros, who live in the larger islands of Mindanao and Jolo, and it is believed that this effort will meet with the same success which has attended the pacification work of the tribes of

Luzon. It is already possible for the doctor and nurse to go in safety to many places which it has been extremely dangerous for the soldier to approach. Experience has shown that even the wildest of the Moros that have resisted all other means of contact may be appealed to through hospital relief. The medical work done in Mindanao is paving the way for establishing industrial and regular schools, and indicates that these people, when properly approached, show a receptive attitude toward civilizing influences.

The establishment of dispensaries at different places in the Sulu Archipelago similar to those in Mindanao and Jolo is not practicable because they would reach only a very small fraction of the inhabitants, who are scattered over a large number of small islands. But these people can be reached by a hospital ship. They are gregarious; they live along the littoral, and the markets where the people congregate at least weekly bring the whole population to the coast. To meet the situation a hospital ship is being provided. The hospital ship will be expected to go from island to island, meeting the people at established points, bringing medical relief to the afflicted, training midwives, giving general instruction to the people, and guiding and stimulating them to self-help. It is expected that this hospital ship will serve as an agency for the promotion of peace and order, that it will help to establish friendly relations between the Fili-

pinos and their Moro neighbors, and that it will serve as an entering wedge for permanent civilizing influences. The International Health Commission has entered into a coöperative arrangement with the Philippine Government for the equipment of such a ship and for its maintenance for a period of five years. It is expected that by the end of this period the ship will have demonstrated its usefulness and that the work will be continued on the basis of Government and local support.

II. SUMMARY OF ACTIVITIES AND RESULTS BY STATES AND COUNTRIES

ALL COUNTRIES

In the states and countries where measures against hookworm disease have been in progress, 1,458,483 persons were microscopically examined by the official working staff during the period from January 1, 1910, to December 31, 1915, and 593,383 persons were treated. The results by both the dispensary and intensive plans of work are included in these figures. In addition to the persons examined and treated by the working force, however, large numbers were examined and treated by practicing physicians, by hospitals, and by other agencies. Reports received from practicing physicians in the Southern States, for example, showed that during the period from January 1, 1910, to December 31, 1915, 260,746 persons had been treated by them for hookworm disease.

Table I exhibits the total number of persons microscopically examined and given first treatment by the working force in all countries up to December 31, 1915. The results accom-

plished during 1915 and prior to 1915 are shown separately.

TABLE I: *All Countries—Dispensary and Intensive Work Combined: Number of Persons Microscopically Examined and Given First Treatment from January 1, 1910, to December 31, 1915.*

With Comparison of Results During 1915 and Prior to 1915.

	Up to December 31, 1915	During 1915	Prior to 1915
1. Microscopically Examined....	1,458,483	333,201	1,125,282
2. Given First Treatment.....	593,383	135,279	458,104

In Table II, figures in detail by states and countries are presented to show the results of examination and treatment during the year 1915. The table includes the combined results for both the dispensary and intensive methods of work. (See Table II, page 81.)

Examination and Treatment: Dispensary Method

In the work of examination and treatment by the dispensary method, 1,390,040 persons were microscopically examined and 565,080 were given first treatment in the period from January 1, 1910, to December 31, 1915.

Table III presents these figures in tabular form, and offers a comparison of the results during 1915 and prior to 1915. (See Table III, page 82.)

TABLE II: *All Countries—Dispensary and Intensive Work Combined: Number of Persons Microscopically Examined and Given First Treatment During 1915, by Countries.*

STATES AND COUNTRIES	Microscopically Examined	Given First Treatment
Total	333,201	135,279
SOUTHERN STATES.....	150,306	41,859
WEST INDIES.....	61,514	34,487
CENTRAL AMERICA.....	114,005	53,909
THE EAST.....	7,376	5,024
Southern States:		
Alabama.....	4,508	1,499
Arkansas.....		
Georgia.....	64,462	21,585
Kentucky.....	25,679	6,274
Louisiana.....		
Mississippi.....	4,852	1,599
North Carolina.....	3,405	802
South Carolina.....	5,487	1,488
Tennessee.....	18,595	3,185
Texas.....	19,578	5,084
Virginia.....	3,740	343
West Indies:		
British Guiana.....	21,070	11,903
Grenada.....	17,079	10,364
St. Lucia.....	7,924	4,106
St. Vincent.....	3,822	1,590
Trinidad.....	11,619	6,524
Central America:		
Costa Rica.....	57,979	23,597
Guatemala.....	25,587	13,783
Nicaragua.....	5,429	1,611
Panama.....	25,010	14,918
The East:		
Egypt.....	7,376	5,024

TABLE III: *All Countries—Dispensary Work: Number of Persons Microscopically Examined and Given First Treatment from January 1, 1910, to December 31, 1915.*

With Comparison of Results During 1915 and Prior to 1915.

	Up to December 31, 1915	During 1915	Prior to 1915
1. Microscopically Examined...	1,390,040	273,953	1,116,087
2. Given First Treatment.....	565,080	109,240	455,840

In Table IV the figures exhibit in detail, by states and countries, the number of persons examined, found infected, and given first treatment in work by the dispensary method during 1915. For Grenada and Costa Rica the percentage of the persons examined who were found infected, and the percentage of infected persons who were given first treatment, have been omitted because the figures for the results of examination in these countries relate to the number of specimens, instead of to the number of persons, examined. In Grenada, furthermore, and in Egypt, treatment was administered on clinical diagnosis to some persons who had not been examined and found positive with the microscope. The percentage figures for the total and sub-totals by geographical divisions are also affected by these considerations.

TABLE IV: *All Countries—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment During 1915, by Countries.*

STATES AND COUNTRIES	NUMBER OF PERSONS			PERCENT-AGE OF PERSONS	
	Examined	Found Infected	Given First Treatment	Found Infected	Given First Treatment
Total.....	273,953	125,462	109,240	....	.....
SOUTHERN UNITED STATES.	129,817	37,758	37,051	29.1	98.1
WEST INDIES.....	22,755	14,128	13,256	....	.....
CENTRAL AMERICA.....	114,005	69,412	53,909	....	.....
THE EAST.....	7,376	4,164	5,024	56.2	.....
Southern United States:					
Alabama.....	4,508	1,499	1,499	33.3	100.0
Georgia.....	64,462	21,914	21,585	34.0	98.5
Kentucky.....	23,846	5,814	5,814	24.4	100.0
Tennessee.....	17,423	3,135	3,069	18.0	97.9
Texas.....	19,578	5,396	5,084	27.6	94.2
West Indies:					
Grenada.....	17,079	10,380	10,364	....	.....
Trinidad.....	5,676	3,748	2,892	65.9	77.2
Central America:					
Costa Rica.....	57,979	34,840	23,597	....	.....
Guatemala.....	25,587	15,001	13,783	58.6	91.9
Nicaragua.....	5,429	2,681	1,611	49.4	60.1
Panama.....	25,010	16,890	14,918	67.5	88.3
The East:					
Egypt.....	7,376	4,164	5,024	56.2	.....

Examination and Treatment: Intensive Method

For all of the countries where intensive work has been conducted from the inauguration of work by that plan on March 12, 1914, up to December 31, 1915, the total number of

persons microscopically examined, found infected, given first treatment, and cured is exhibited in Table V. It will be seen that in all of the areas where work by this plan has been conducted, there resided 86,958 persons. Of these, 68,443, or 78.7 per cent, were microscopically examined; and 30,655, or 44.6 per cent of those examined, were found infected. First treatment was administered to 28,303, or 92.3 per cent of those found infected; and 17,863, or 63.1 per cent of those receiving first treatment, were shown by microscopic re-examination to have been cured. A comparison of the results during 1915 with those during 1914 is offered in the table.

TABLE V: *All Countries—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from March 12, 1914, to December 31, 1915.*

With Comparison of Results During 1915 and During 1914.

	UP TO DECEMBER 31, 1915		DURING 1915		DURING 1914	
	No.	P.C.	No.	P.C.	No.	P.C.
1. Census.....	86,958	....	74,653	....	12,305	....
2. Examined.....	68,443	78.7	59,248	79.4	9,195	74.7
3. Found Infected.	30,655	44.6	28,237	47.7	2,418	26.3
4. Given First Treatment...	28,303	92.3	26,039	92.2	2,264	93.6
5. Cured.....	17,863	63.1	17,210	66.1	653	28.8

The detailed results of examination and treatment by the intensive method during 1915 are exhibited in Table VI. In this table the figures for the West Indies give a more reliable index to the effectiveness of work by the intensive plan in the relief and cure of sufferers than do the figures for the Southern States, where the staff devoted its main energies to securing sanitary improvement. (See Table VI, page 86.)

In all of the areas where work was conducted in the West Indies during 1915, 23,247 persons were found infected. Table VI shows that 16,278 were cured. This represents 70.0 per cent of the total infected. In addition, 2,249, or 9.7 per cent of the infected persons, removed from the areas while the work was in progress, leaving in the areas uncured at the close of work, 4,720 infected persons, or 20.3 per cent of the total. Of these, 2,574 refused either to accept first treatment or to continue treatment until cured, 822 could not be treated for medical reasons, and 1,324 were under treatment but had not been treated a sufficient number of times for a cure to be effected when the work in the areas was ended.

Table VII presents a brief summary showing the total number of infected persons remaining uncured in the areas where intensive work was conducted in the West Indies during 1915. (See Table VII, page 87.)

TABLE VI: *All Countries—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured During 1915, by Countries.*

STATES AND COUNTRIES	Population	NUMBER OF PERSONS				PERCENTAGE OF PERSONS			
		Examined	Found Infected	Given First Treatment	Cured	Examined	Found Infected	Given First Treatment	Cured
Total	74,653	59,248	28,237	26,039	17,210	79.4	47.7	92.2	66.1
Southern United States:									
Kentucky.....	1,987	1,833	460	460	316	92.2	25.1	100.0	68.7
Mississippi.....	8,028	4,852	1,611	1,599	53	60.4	33.2	99.3	3.3
North Carolina.....	5,056	3,405	898	802	228	67.3	26.4	89.3	28.4
South Carolina.....	6,790	5,487	1,561	1,488	231	80.8	28.4	95.3	15.5
Tennessee.....	3,316	1,172	116	116	20	35.3	9.9	100.0	17.2
Virginia.....	8,681	3,740	344	343	84	43.1	9.2	99.7	24.5
West Indies:									
British Guiana.....	22,323	21,070	13,135	11,903	10,039	94.4	62.3	90.6	84.3
St. Lucia.....	8,149	7,924	4,436	4,106	2,177	97.2	56.0	92.6	53.0
St. Vincent.....	3,825	3,822	1,676	1,590	1,350	99.9	43.9	94.9	84.9
Trinidad.....	6,498	5,943	4,000	3,632	2,712	91.5	67.3	90.8	74.7

TABLE VII: *West Indies—Intensive Work: Number of Infected Persons Remaining in Areas Uncured at Close of Work, During 1915.*

	No.	P. C.
1. Infected with Uncinariasis.....	23,247	....
2. Cured.....	16,278	70.0
3. Removed from Areas.....	2,249	9.7
4. Remaining in Areas Uncured.....	4,720	20.3
(a) Refused..... 2,574		
(b) Medical Reasons..... 822		
(c) Under Treatment..... 1,324		

TABLE VIII: *West Indies—Intensive Work: Detailed Results of Examination and Treatment During 1915.*

	Number of Persons
1. Census.....	40,795
2. Examined.....	38,759
3. Found Infected.....	23,247
4. Given First Treatment.....	21,231
5. Not Given First Treatment.....	2,016
(a) Removed.....	841
(b) Died.....	6
(c) Refused.....	403
(d) Medical Reasons.....	766
6. Cured.....	16,278
7. Given First Treatment but Not Cured.....	4,953
(a) Refused.....	2,171
(b) Medical Reasons.....	56
(c) Removed.....	1,382
(d) Died.....	20
(e) Under Treatment.....	1,324

Figures for the West Indian colonies showing in detail the results of examination and treatment in the areas where work was conducted by the intensive method during 1915 are exhibited in Table VIII. (See Table VIII, page 87.)

The figures given in the foregoing tables for the number of persons remaining in the areas uncured at the close of work are based in all cases upon the number of persons definitely known to have been infected. The actual number of persons remaining uncured will probably be greater in every instance than the tables show, for two reasons: first, a certain proportion of the persons who, for various reasons, were not examined were doubtless infected; and secondly, allowance must be made for errors and faulty technique in the microscopic examination of specimens. All of the tables in this report are confined to figures definitely known; estimated figures in all cases have been excluded.

In figuring the percentage of persons remaining in the areas uncured at the close of work, the original number of infected cases, and not the total population of the areas, is taken as the base. If figures for the total population were used as the basis of calculation, the percentage of uncured persons remaining in the areas would be considerably lower. In order to arrive at the percentage of uncured persons based upon the population, however, it is necessary to take into consideration a number of estimated factors.

The number of persons cured is based upon the number of persons previously infected in whose feces no ova could be detected on the last examination. In considering these figures two things should be borne in mind: first, in a large number of cases, re-examinations for demonstrating whether a cure has been effected are lacking; and secondly, allowance must be made for the possibility of error in examining specimens. In some cases a patient may be infected, but a careful search may fail to reveal ova in his stool. The number of such cases will depend upon the thoroughness of the microscopic technique, but in any event will be relatively small and will apply only to those persons who are lightly infected.

The terms "Not Treated for Medical Reasons" and "Not Cured for Medical Reasons," as used in the tables exhibiting the detailed results of work by the intensive method, relate to very old or emaciated persons, pregnant women, or sufferers from acute heart or kidney disease, typhoid fever, malaria, dysentery, or diarrhoea. To administer treatment for hookworm disease to these persons might cause serious complications and possibly death. Consequently the treatment is spoken of as withheld for medical reasons.

Persons who have taken one or more treatments for hookworm disease, but have abandoned treatment before being cured, are classed as "Refused" in the tables exhibiting detailed

results. The persons who refuse treatment may be divided into two groups: those who refuse to accept even the first treatment, and those who accept one or more treatments but do not continue treatment until cured. Persons who die within the areas of operation while the work is in progress are included in the heading "Removed from Area." In no case on record was the death of any of these persons connected with the administration of treatment for hookworm disease.

Sanitary Improvement

In all of the states and countries where intensive work has been conducted, efforts to secure sanitary improvement have been given due attention. This feature of the work has received particular emphasis in the Southern States, and the results accomplished there are more adequately discussed in later pages. In Guatemala and Costa Rica, too, though the work has followed the dispensary plan, the working staff has devoted much of its time to securing the installation and maintenance of satisfactory latrines. Elsewhere the work has been largely educational or persuasive in character, and the results have not been such as could be definitely measured and recorded.

In the countries, besides Guatemala,¹ where

¹ In Guatemala the results have been reported on a basis somewhat different from the other countries. They are discussed separately in the section of this chapter devoted to that country (see pages 174-176).

definite progress has been made in the improvement of sanitary conditions, 24,956 homes were inspected during the period from March 12, 1914, to December 31, 1915. Of these, only 8,128, or 32.6 per cent, were found to have latrines on the first inspection, as compared with 13,909, or 55.7 per cent, on the last. The actual number of new latrines installed was 5,781, reducing the percentage of homes without latrines from 67.4 to 44.3.

These results are exhibited in Table IX, in which a comparison is offered of the results during 1915 and prior to 1915.

TABLE IX: *All Countries—Sanitary Improvement from March 12, 1914, to December 31, 1915.*

With Comparison of Results During 1915 and Prior to 1915

	UP TO DECEMBER 31, 1915		DURING 1915		PRIOR TO 1915	
	No.	P.C.	No.	P.C.	No.	P.C.
1. Homes Inspected.....	24,956	....	22,699	....	2,257	....
2. Homes With Latrines:						
(a) First Inspection..	8,128	32.6	7,001	30.8	1,127	49.9
(b) Last Inspection..	13,909	55.7	11,921	52.5	1,988	88.1
3. Homes Without Latrines:						
(a) First Inspection..	16,828	67.4	15,698	69.2	1,130	50.1
(b) Last Inspection..	11,047	44.3	10,778	47.5	269	11.9

Figures showing by states and countries the results of sanitary improvement during 1915 are presented in Table X.

TABLE X: *All Countries—Sanitary Improvement During 1915, by Countries.*

STATES AND COUNTRIES	Number of Homes Inspected	NUMBER OF HOMES				PERCENTAGE OF HOMES			
		With Latrines		Without Latrines		With Latrines		Without Latrines	
		First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection
Total.....	22,699	7,001	11,921	15,698	10,778	30.8	52.5	69.2	47.5
Southern United States:									
Kentucky.....	353	139	353	214	.....	39.4	100.0	60.6	.....
Mississippi.....	1,571	417	1,015	1,154	556	26.5	64.6	73.5	35.4
North Carolina.....	1,059	619	932	440	127	58.5	88.0	41.5	12.0
South Carolina.....	1,661	812	1,192	849	469	48.9	71.8	51.1	28.2
Tennessee.....	690	150	399	540	291	21.7	57.8	78.3	42.2
Virginia.....	1,802	1,367	1,436	435	366	75.9	79.7	24.1	20.3
West Indies:									
British Guiana.....	6,147	2,524	3,918	3,623	2,229	41.1	63.7	58.9	36.3
St. Lucia.....	419	20	119	399	300	4.8	28.4	95.2	71.6
St. Vincent.....	736	86	434	650	302	11.7	59.0	88.3	41.0
Central America:									
Costa Rica.....	8,261	867	2,123	7,394	6,138	10.5	25.7	89.5	74.3

SOUTHERN STATES

During 1915, the state boards of health in ten Southern states conducted measures for the relief and control of hookworm disease. In three of the states—Alabama, Georgia, and Texas—work was conducted by the dispensary plan only; in five—Louisiana, Mississippi, North Carolina, South Carolina, and Virginia—by the intensive plan only; and in two—Kentucky and Tennessee—by both the dispensary and intensive plans. The work was in progress continuously during the year in the states of Kentucky, Mississippi, South Carolina, Tennessee, and Virginia. Table 1 shows, for both the dispensary and intensive plans of work, the length of time operations were in progress in each state during 1915. (See Table 1, page 94.)

Examination and Treatment: Dispensary Method

Prior to 1915, operations by the dispensary method had been conducted by all of these states and by Arkansas. This work succeeded in reaching almost all of the heavily infected counties in these states, so that at the beginning of 1915 there remained only a few counties still to be visited by dispensaries. These counties were located in the states of Alabama, Kentucky, Tennessee, and Texas. During 1915 the work was extended to them. Table 2 shows, by states, the extent of operations conducted by

TABLE 1: *Southern States—Extent of Operations During 1915, by States.*

STATE	DISPENSARY WORK		INTENSIVE WORK	
	From	To	From	To
Alabama.....	January 1, 1915	April 30, 1915	.....	.....
Georgia.....	January 1, 1915	June 30, 1915	.....	.....
Kentucky.....	May 15, 1915	November 18, 1915	January 1, 1915	December 31, 1915
Louisiana*.....	.....	.....	August 23, 1915	December 31, 1915
Mississippi.....	.....	.....	January 1, 1915	December 31, 1915
North Carolina.....	.....	.....	January 1, 1915	April 30, 1915
South Carolina.....	.....	.....	January 1, 1915	December 31, 1915
Tennessee.....	.....	.....	July 1, 1915	December 31, 1915
Texas.....	January 1, 1915	June 30, 1915	.....	.....
Virginia.....	January 1, 1915	June 30, 1915	.....	.....
	.....	.....	January 1, 1915	December 31, 1915

* Operations on the intensive plan were begun in Louisiana on August 13, 1915, but up to December 31, 1915, work in no geographical area had been completed. For this reason figures for this State are omitted from the tables showing the results accomplished during 1915.

the dispensary plan up to December 31, 1915, and offers a comparison of the number of counties having dispensary work completed during 1915 and prior to 1915.

TABLE 2: *Southern States—Dispensary Work: Number of Counties Having Dispensary Work Completed from January 1, 1910, to December 31, 1915, by States.*

With Comparison of Results During 1915 and Prior to 1915.

STATES	Number of Counties in State	NUMBER OF COUNTIES HAVING DISPENSARY WORK COMPLETED		
		Up to December 31, 1915	During 1915	Prior to 1915
Total.....	1,142	700	122	578
Alabama.....	67	60	7	53
Arkansas.....	75	43	...	43
Georgia.....	148	134	68	66
Kentucky.....	120	39	7	32
Louisiana.....	64	49	...	49
Mississippi.....	79	76	...	76
North Carolina.....	100	99	...	99
South Carolina.....	44	41	...	41
Tennessee.....	96	61	18	43
Texas.....	249	67	22	45
Virginia.....	100	31	...	31

In the dispensary work conducted up to December 31, 1915, 1,217,483 persons were microscopically examined, of whom 396,725, or 32.6 per cent, were found to be infected. First treatment was administered to 477,427 persons, 80,702 in excess of those found infected. This excess of persons treated over those found infected is due to the fact that in the early work a great many patients who had not

been examined with the microscope were given treatment on clinical diagnosis. Table 3 exhibits figures showing the total number of persons microscopically examined, found infected, and given first treatment in all of the dispensary work conducted in the Southern States from January 1, 1910, up to December 31, 1915.

TABLE 3: *Southern States—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from January 1, 1910, to December 31, 1915.*

With Comparison of Results During 1915 and Prior to 1915.

	UP TO DECEMBER 31, 1915		DURING 1915		PRIOR TO 1915	
	No.	P.C.	No.	P.C.	No.	P.C.
1. Examined.....	1,217,483	....	129,817	....	1,087,666	....
2. Found Infected.	396,725	32.6	37,758	29.1	358,967	33.0
3. Given First Treatment...	477,427	....	37,051	98.1	440,376	....

During the year 1915, the number of persons examined was 129,817, of whom 37,758, or 29.1 per cent, were found infected. First treatment was administered to 37,051, or 98.1 per cent of those found infected. The results by states for the year 1915 are exhibited in Table 4. (See Table 4, page 97.)

Lectures and Addresses

During the progress of the dispensary work, considerable effort was devoted to lectures, to

TABLE 4: Southern States—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment During 1915, by States.

STATES	NUMBER OF PERSONS			PERCENTAGE OF PERSONS	
	Examined	Found Infected	Given First Treatment	Found Infected	Given First Treatment
Total.....	129,817	37,758	37,051	29.1	98.1
Alabama.....	4,508	1,499	1,499	33.3	100.0
Georgia.....	64,462	21,914	21,585	34.0	98.5
Kentucky.....	23,846	5,814	5,814	24.4	100.0
Tennessee.....	17,423	3,135	3,069	18.0	97.9
Texas.....	19,578	5,396	5,084	27.6	94.2

TABLE 5: Southern States—Dispensary Work: Number of Lectures Delivered from January 1, 1910, to December 31, 1915, with Attendance.

With Comparison of Results for 1915 and Prior to 1915.

	Up to December 31, 1915	During 1915	Prior to 1915
Total Lectures.....	29,396	3,935	25,461
Public.....	18,474	2,378	16,096
School.....	9,621	1,344	8,277
Special.....	1,301	213	1,088
Attendance at Lectures...	2,404,230	245,102	2,159,128
Public.....	1,796,018	134,840	1,661,178
School.....	506,911	89,882	417,029
Special.....	101,301	20,380	80,921

TABLE 6: *Southern States—Dispensary Work: Number of Lectures Delivered During 1915, with Attendance, by States.*

STATES	NUMBER OF LECTURES				ATTENDANCE AT LECTURES			
	Total	Public	School	Special	Total	Public	School	Special
Total.....	3,935	2,378	1,344	213	245,102	134,840	89,882	20,380
Alabama.....	256	194	59	3	20,950	17,623	3,230	97
Georgia.....	2,375	1,428	906	41	124,236	68,979	52,919	2,338
Kentucky.....	515	275	139	101	38,197	19,998	6,106	12,093
Tennessee.....	265	193	60	12	20,844	13,455	6,639	750
Texas.....	524	288	180	56	40,875	14,785	20,988	5,102

the distribution of literature, and to educational activities in general. Table 5 indicates that up to December 31, 1915, 29,396 lectures on hookworm disease and related topics had been delivered to a combined audience estimated at 2,404,230 persons. Of these lectures, 18,474 were for the public, 9,621 for school children, and 1,301 for specially selected audiences. Table 5 offers figures showing the number of lectures delivered up to December 31, 1915, with a comparison of the number delivered during 1915 and prior to 1915. (See Table 5, page 97.)

The number of lectures delivered during 1915 is reported by states in Table 6. (See Table 6, page 98.)

Distribution of Literature

Table 7 shows the number of pieces of literature distributed up to December 31, 1915, and compares the number distributed during 1915 with the number prior to 1915.

TABLE 7: *Southern States—Dispensary Work: Number of Pieces of Literature Distributed from January 1, 1910, to December 31, 1915.*

With Comparison of Results for 1915 and Prior to 1915.

	Up to December 31, 1915	During 1915	Prior to 1915
Total.....	3,878,712	161,282	3,717,430
Number of Letters Mailed....	429,727	30,739	398,988
Number of Pieces of Literature Distributed.....	3,448,985	130,543	3,318,442

Figures for the number of pieces of literature distributed during 1915, by states, are presented in Table 8.

TABLE 8: *Southern States—Dispensary Work: Number of Pieces of Literature Distributed During 1915, by States.*

STATES	Total	No. of Letters Mailed	No. of Pieces of Literature Distributed
Total.....	161,282	30,739	130,543
Alabama.....	10,700	700	10,000
Georgia.....	81,752	18,092	63,660
Kentucky.....	31,241	6,241	25,000
Tennessee.....	19,850	1,850	18,000
Texas.....	17,739	3,856	13,883

Examination and Treatment: Intensive Method

During 1914 the intensive plan had been tried out in certain states which had been earliest in completing the dispensary work; in that year, work by this plan had been completed in twelve communities, three located in the state of Louisiana, six in North Carolina, two in South Carolina, and one in Virginia. With the completion of dispensary work during 1915 in the heavily infected counties of the other states, came the final transition from the dispensary to the intensive plan of work. In the year 1915, work by the intensive plan was completed in fifty-nine additional communities, making the total number of communities in which work had

been completed up to December 31, 1915, seventy-one. Table 9 shows, by states, the number of communities completed during 1915 and during 1914.

TABLE 9: *Southern States—Intensive Community Work: Number of Communities Completed from May 1, 1914, to December 31, 1915.*

With Comparison of Results During 1915 and During 1914.

STATES	NUMBER OF COMMUNITIES COMPLETED		
	Up to December 31, 1915	During 1915	During 1914
Total.....	71	59	12
Kentucky.....	3	3	..
Louisiana.....	3	..	3
Mississippi.....	14	14	.
North Carolina.....	14	8	6
South Carolina.....	14	12	2
Tennessee.....	6	6	..
Virginia.....	17	16	1

The chief aim of the intensive work as conducted by these states has been to see that adequate sanitary accommodations are provided for rural homes. Upon the curative side of the work no particular stress has been laid, because in almost all of the communities the infection existing when the intensive work was undertaken was found to be light, due no doubt to the efforts of the practicing physicians and in part to the dispensary work, with its accompanying educational activities, which had been previously conducted.

In the seventy-one communities in which work was completed up to December 31, 1915, there resided 46,163 persons. Of these, 29,684, or 64.3 per cent, were microscopically examined; and 7,408, or 25.0 per cent, were found to be infected. First treatment was administered to 7,072 persons, or 95.5 per cent of those infected; and 1,585, or 22.4 per cent of those receiving first treatment, were shown by microscopic re-examination to have been cured.

Table 10 presents this information in tabular form and offers a comparison of the results during 1915 with those during 1914.

TABLE 10: *Southern States—Intensive Community Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured, from May 1, 1914, to December 31, 1915.*

With Comparison of Results During 1915 and During 1914.

	UP TO DECEMBER 31, 1915		DURING 1915		DURING 1914	
	No.	P.C.	No.	P. C.	No.	P. C.
1. Census.....	46,163	....	33,858	....	12,305	....
2. Examined.....	29,684	64.3	20,489	60.5	9,195	74.7
3. Found Infected.	7,408	25.0	4,990	24.4	2,418	26.3
4. Given First Treatment...	7,072	95.5	4,808	96.4	2,264	93.6
5. Cured.....	1,585	22.4	932	19.4	653	28.8

A detailed summary of the results accomplished during the year 1915, by states, is given in Table 11.

TABLE II: Southern States—Intensive Community Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured During 1915, by States.

STATES	NUMBER OF PERSONS					PERCENTAGE OF PERSONS			
	Census	Examined	Found Infected	Given First Treatment	Cured	Examined	Found Infected	Given First Treatment	Cured
Total.....	33,858	20,489	4,990	4,808	932	60.5	24.4	96.4	19.4
Kentucky.....	1,987	1,833	460	460	316	92.2	25.1	100.0	68.7
Mississippi.....	8,028	4,852	1,611	1,599	53	60.4	33.2	99.3	3.3
North Carolina.....	5,056	3,405	898	802	228	67.3	26.4	89.3	28.4
South Carolina.....	6,790	5,487	1,561	1,488	231	80.8	28.4	95.3	15.5
Tennessee.....	3,316	1,172	116	116	20	35.3	9.9	100.0	17.2
Virginia.....	8,681	3,740	344	343	84	43.1	9.2	99.7	24.5

Sanitary Improvement

In the work directed toward the improvement of sanitation, upon which chief emphasis is laid in the intensive work conducted in the Southern States, the progress made up to December 31, 1915, in having latrines provided at the farm homes is exhibited in Table 12. In the seventy-one communities in which the work was conducted there were 9,393 homes. On the first inspection of the premises, it was found that only 4,631, or 49.3 per cent, were provided with latrines of any kind, and many of these were entirely inadequate for preventing soil pollution. On the last inspection, latrines were found at

TABLE 12: *Southern States—Intensive Community Work: Sanitary Improvement from May 1, 1914, to December 31, 1915.*

With Comparison of Results During 1915 and During 1914.

	NUMBER			PERCENTAGE		
	Up to December 31, 1915	During 1915	During 1914	Up to December 31, 1915	During 1915	During 1914
Homes Inspected.....	9,393	7,136	2,257	....	....	....
Homes With Latrines:						
On First Inspection..	4,631	3,504	1,127	49.3	49.1	50.0
On Last Inspection..	7,315	5,327	1,988	77.9	74.6	88.1
Homes Without Latrines:						
On First Inspection..	4,762	3,632	1,130	50.7	50.9	50.1
On Last Inspection..	2,078	1,809	269	22.1	25.4	11.9

7,315 homes, showing an increase in the percentages of homes with latrines from 49.3 to 77.9. The number of new latrines erected was 2,684, reducing the percentage of homes without latrines from 50.7 to 22.1. (See Table 12, page 104.)

In Table 13 figures are presented showing, by states, the progress made during 1915 in having latrines provided at the farm homes. (See Table 13, page 106.)

In neither table, however, do the figures convey an adequate impression of the real extent to which the sanitation of these communities has been improved. In addition to the new latrines erected, many that were of a crude type have been improved and made adequate for preventing soil pollution. Nor do the figures take into account the number of new latrines erected or old ones improved at schools, churches, and other public and private buildings not classified as homes; nor the improvement made at homes located outside the limits of the particular communities in which the work was conducted. It has been found everywhere that the influence of the work radiates into the surrounding territory and that many latrines are installed at homes not included within the community survey, and many persons examined and treated who reside outside of the community. It has been found also that many families which were unable, from one cause or another, to install or improve latrines at their homes while the work

TABLE 13: Southern States—Intensive Community Work: Sanitary Improvement During 1915, by States.

STATES	Number of Homes Inspected	NUMBER OF HOMES				PERCENTAGE OF HOMES			
		With Latrines		Without Latrines		With Latrines		Without Latrines	
		First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection
Total	7,136	3,504	5,327	3,632	1,809	49.1	74.6	50.9	25.4
Kentucky.....	353	139	353	214	....	39.4	100.0	60.6	....
Mississippi.....	1,571	417	1,015	1,154	556	26.5	64.6	73.5	35.4
North Carolina.....	1,059	619	932	440	127	58.5	88.0	41.5	12.0
South Carolina.....	1,661	812	1,192	849	469	48.9	71.8	51.1	28.2
Tennessee.....	690	150	399	540	291	21.7	57.8	78.3	42.2
Virginia.....	1,802	1,367	1,436	435	366	75.9	79.7	24.1	20.3

was going on, make the necessary improvement after the work has been completed. Of incidental results such as these, the figures in the tables take no account.

The by-products of the work, one may venture to think, are even more important than the control of hookworm disease. While being taught how to control this one disease the people are also instructed in the prevention of typhoid, and are shown that in putting a stop to soil pollution to prevent hookworm disease they are at the same time preventing the spread of typhoid and other enteric diseases. Incidentally they are also shown the dangers of the fly in spreading typhoid and of the mosquito in spreading malaria; and as a result of this community work they become active in screening against flies and mosquitoes, although the primary effort has centered not on the screening but on the building of latrines. In teaching the people by demonstration how to control this one disease, an object lesson is given in the control of disease. Already this work has identified itself strongly with the movement for improvement in rural hygiene and sanitation, and as the outcome one may foresee the whole-time county health officer directing local agencies for the control of disease at the farm homes as disease is now being controlled in the larger towns and cities.

ANTIGUA

A preliminary survey for determining the prevalence and effects of hookworm disease in Antigua was conducted by Dr. Eric Marshall from August 1, 1914, to November 27, 1914. This investigation showed that in certain districts a large percentage of the people were infected, that the disease was the cause of much sickness, and that under certain conditions it might become a menace to the health of the whole Island. Its distribution led to the belief that it could be readily dealt with by work of an intensive nature. Arrangements were made for beginning work, and Dr. P. W. Covington, who had been appointed Director, began active measures against the disease on September 15, 1915.

The intensive plan of work was selected for preliminary operations. To assist the Director, a staff composed of two microscopists, three nurses and assistant nurses, a varying number of supernumerary nurses, and a caretaker, was appointed.

Examination and Treatment

Up to December 31, 1915, operations had been confined to the York Valley District. In this area, roughly two miles in diameter, were included ten villages, with a combined population of 1,956 persons, of whom almost all are negroes.

Work in this area had not been completed up to December 31, 1915, but 1,921 persons, or 98.2 per cent of the inhabitants, had been examined. Of these, 524, or 27.3 per cent, were found infected; and 432, or 82.4 per cent of those infected, were given first treatment. By microscopic re-examination following treatment, 284 persons (65.7 per cent of those treated) were found to have been cured. These details are shown more clearly in Table 1.

TABLE 1: *Antigua—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from September 15, 1915, to December 31, 1915.*

	No.	P. C.
1. Census.....	1,956	....
2. Examined.....	1,921	98.2
3. Found Infected.....	524	27.3
4. Given First Treatment.....	432	82.4
5. Cured.....	284	65.7

Since one of the aims of intensive work is to leave in the area as few uncured persons as possible as foci of infection, Table 2 gives information in detail showing how many of the persons found infected could not be treated for medical reasons, how many removed, and how many were still under treatment. This table is summarized briefly in the following statement, which indicates how many of the infected per-

sons remained in the area uncured on December 31, 1915:

	<u>No.</u>	<u>P.C.</u>
1. Infected.....	524	....
2. Cured.....	284	54.2
3. Removed from area.....	24	4.6
4. Remaining in area uncured.....	216	41.2
Not cured for medical reasons.	35	
Still to be treated.....	181	

TABLE 2: *Antigua—Intensive Work: Detailed Results of Examination and Treatment from September 15, 1915, to December 31, 1915.*

	No.	P. C.
1. Census.....	1,956	....
2. Examined.....	1,921	98.2
3. Found Infected.....	524	27.3
4. Given First Treatment.....	432	82.4
5. Not Given First Treatment:	92	17.6
(a) Removed.....	15	....
(b) Died.....	3	....
(c) Medical reasons.....	25	....
(d) To be treated.....	49	....
6. Cured.....	284	65.7
7. Given First Treatment But Not Cured:	148	34.3
(a) Removed.....	6	....
(b) Died.....	0	....
(c) Medical reasons.....	10	....
(d) Under treatment.....	132	....

Educational Work

When the work was undertaken in the York Valley District an inaugural meeting was held at which His Excellency, the Acting Governor

of Antigua, presided. A number of addresses illustrated by lantern slides, telling in detail the story of the disease, were delivered at this meeting. In the work up to December 31, 1915, sixteen lectures were delivered and approximately 2,000 circulars distributed. Included among the lectures were a number of illustrated talks delivered at the schoolhouses throughout the area.

Sanitary Improvement

The nurses in visiting the homes to take the census, make a note of the sanitary conditions found. In the York Valley District, out of 413 homes, only ten were found to be provided with satisfactory latrines. Measures of sanitary improvement, such as draining and clearing the ground of undergrowth around the villages and erecting suitable latrines to prevent further soil pollution, are in the hands of the Government of Antigua. Sanitary inspectors have been appointed to enforce the installation and proper maintenance of suitable latrines, but no definite results had been accomplished up to December 31, 1915. There was, however, every evidence that activities would soon be under way.

BRITISH GUIANA

Operations against hookworm disease in British Guiana are in charge of Dr. F. E. Field, the Supervising Medical Officer, who acts under the direction of the Surgeon General. The Government Medical Officers of the districts in which work has been conducted have given much advice and assistance.

Preliminary operations were undertaken in the Peter's Hall district, lying on the east bank of the Demerara river just south of Georgetown. Active work was begun on March 12, 1914, and continued until March 31, 1915. Meanwhile, on January 9, 1915, operations were begun in the Belle Vue district, lying on the west bank of the Demerara river opposite the Peter's Hall district. Work in this second area had been practically completed by September 15, 1915. Work in a third area was then begun but had not been completed by December 31, 1915; hence, the figures in this report are confined to the results accomplished in the Peter's Hall and Belle Vue districts.

For the sake of convenience in operation, both the Peter's Hall and Belle Vue districts were sub divided into three areas termed A, B, and C. In mapping out the areas consideration was given to natural boundaries, and effort was made so far as possible to divide the districts into areas having approximately the same number of inhabitants.

The Peter's Hall district is about eight miles long and from one to three miles wide. It has villages and sugar plantations on both sides of one long road. There are few isolated houses. The work was confined to the free population, numbering 10,380 persons of the East Indian, colored, black, Portuguese, and Chinese races. Indentured laborers on sugar plantations were excluded because they were being effectively treated by the Government Medical Officer at the expense of the plantation owners. The staff engaged in the Peter's Hall district consisted of the supervising medical officer, two clerks, twelve nurses and twenty-four assistant nurses, three microscopists, and three caretakers.

The Belle Vue district is about fourteen miles long, with villages and sugar plantations on both sides of a public road. At a point near the center of this road another road about eight miles in length, with villages and plantations on both sides, branches off from it. As in the Peter's Hall district, the work was confined to the free population living in villages. This population numbered 11,943, including negroes, East Indians, persons of mixed blood, Chinese, and Europeans. In the Belle Vue district the staff, in addition to the supervising medical officer, consisted of four clerks, four microscopists, eleven nurses and twenty-three assistant nurses, and three caretakers. Headquarters for the supervising medical officer, the clerks, and three

of the microscopists were established in the center of the district; a fourth microscopist was stationed in the extreme southern part; and smaller dispensaries attended by nurses and their assistants, with a microscopist whenever occasion demanded, were located in the principal villages.

Lying at a lower level than the high tides of the Demerara river on which it is located; abounding in dense vegetation; completely inundated during the rainy season and in certain sections during the greater part of the year, the Belle Vue district offers conditions ideal for the perpetuation of hookworm disease, fevers, and other maladies. It was selected because it was one of the most unsanitary districts in the colony, almost unrivaled in its high death rate, and a constant menace to the city of Georgetown because malaria, hookworm disease, and dysentery had long flourished in it.

Examination and Treatment

The combined village population of the Peter's Hall and Belle Vue districts was 22,323. Of these, 21,070, or 94.4 per cent, were microscopically examined; and 13,135, or 62.3 per cent, were found infected. First treatment was administered to 11,903, or 90.6 per cent of the infected persons; and 10,039, or 84.3 per cent of those receiving first treatment, were kept

under treatment until cured. Table 1 presents these figures itemized for each district.

TABLE 1: *British Guiana—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from March 12, 1914, to December 31, 1915, by Areas.*

	NUMBER OF PERSONS			PERCENTAGE OF PERSONS		
	Total	Peter's Hall District	Belle Vue District	Total	Peter's Hall District	Belle Vue District
1. Census.....	22,323	10,380	11,943	....	....	....
2. Examined.....	21,070	9,537	11,533	94.4	91.9	96.6
3. Found Infected....	13,135	5,590	7,545	62.3	58.6	65.4
4. Given First Treatment.....	11,903	5,160	6,743	90.6	92.3	89.4
5. Cured.....	10,039	4,109	5,930	84.3	79.6	87.9

It will be seen that the percentage of infection was higher in the Belle Vue than in the Peter's Hall district, being 65.4 per cent as compared with 58.6 per cent. In the number and percentage of infected persons cured, the work in the Belle Vue district exceeded that in the Peter's Hall: in the former, the staff succeeded in curing 87.9 per cent of the infected persons; in the latter, 79.6 per cent.

In the two districts combined there were 1,682 infected persons, or 12.8 per cent of the total infected, who could not be cured for various

reasons: in the Peter's Hall district the infected persons remaining uncured represented 13.7 per cent of the total infected persons; in the Belle Vue district, 12.2 per cent. The largest single group of these 1,682 infected persons were the 911 persons who were under treatment but had not been treated a sufficient number of times before the close of the work for a cure to be effected. The health of practically all of these persons was undoubtedly much benefited as a result of treatment; in many, perhaps, only the microscopic demonstration of cure was lacking. There were also 498 infected persons who could not be cured for medical reasons and 273 who refused either to accept first treatment or to continue treatment until cured. Figures showing the number of persons remaining uncured in

TABLE 2: *British Guiana—Intensive Work: Number of Persons Remaining Uncured in Areas Worked from March 12, 1914, to December 31, 1915.*

	TOTAL		PETER'S HALL DISTRICT		BELLE VUE DISTRICT	
	No.	P.C.	No.	P.C.	No.	P.C.
1. Infected.....	13,135	....	5,590	....	7,545	....
2. Cured.....	10,039	76.4	4,109	73.5	5,930	78.6
3. Removed.....	1,414	10.8	717	12.8	697	9.2
4. Remaining in Area Uncured:	1,682	12.8	764	13.7	918	12.2
(a) Not cured for medical reasons..	498	....	160	....	338	....
(b) Refused.....	273	....	120	....	153	....
(c) Under treat- ment.....	911	....	484	....	427	....

each area at the close of the work are given in Table 2 (see Table 2, page 116); more detailed information as to the results of examination and treatment will be found in Table 3.

TABLE 3: *British Guiana—Intensive Work: Detailed Results of Examination and Treatment from March 12, 1914, to December 31, 1915, by Areas.*

	NUMBER OF PERSONS		
	Total	Peter's Hall District	Belle Vue District
1. Census.....	22,323	10,380	11,943
2. Not Located.....	1,253	843	410
3. Examined.....	21,070	9,537	11,533
4. Found Infected.....	13,135	5,590	7,545
5. Given First Treatment.....	11,903	5,160	6,743
6. Not Given First Treatment....	1,232	430	802
(a) Removed.....	678	248	430
(b) Refused.....	56	22	34
(c) Medical Reasons.....	498	160	338
7. Cured.....	10,039	4,109	5,930
8. Given First Treatment But Not Cured.....	1,864	1,051	813
(a) Removed.....	723	462	261
(b) Refused.....	217	98	119
(c) Died.....	13	7	6
(d) Under Treatment.....	911	484	427

Educational Work

Before work was begun in either area an inaugural meeting was held to acquaint the people with its purpose and scope. His Excellency the Governor, the prelates, the Surgeon General,

members of the legislature, the clergy, local medical officers, and leading members of the village communities were in attendance. Other public meetings have also been held from time to time, and special lectures have been delivered to school-teachers and school-children, and to persons of other classes. An idea of the extent of the educational work conducted in both areas may be gained from Table 4, which indicates that a total of 42 lectures, attended by 9,911 persons, was delivered in both districts.

TABLE 4: *British Guiana—Intensive Work: Number of Lectures Delivered from March 12, 1914, to December 31, 1915, with Attendance.*

	Total	Peter's Hall District	Belle Vue District
Total Lectures	42	26	16
Public.....	25	17	8
School.....	11	4	7
Special.....	6	5	1
Attendance at Lectures	9,911	5,270	4,641
Public.....	4,862	1,638	3,224
School.....	1,434	692	742
Special.....	3,615	2,940	675

In addition to this, many informal house-to-house talks and demonstrations with the microscope were given as the work progressed. Pamphlets and posters setting forth the symptoms of the disease, the ease with which it can be cured, and the beneficial results of treatment were distributed throughout the villages. These

pamphlets and posters were printed in English and Hindi; and served not only to further a knowledge of the disease but also to secure the coöperation of the people in the work being done for its relief and control.

Table 5 shows the number of pieces of literature distributed in each district.

TABLE 5: *British Guiana—Intensive Work: Number of Pieces of Literature Distributed from March 12, 1914, to December 31, 1915, by Areas.*

	Total	Peter's Hall District	Belle Vue District
Total.....	12,007	6,082	5,925
Pamphlets.....	10,338	4,506	5,832
Posters.....	1,649	1,556	93
Not Classified.....	20	20	....

Sanitary Improvement

To secure the necessary improvement in sanitation the Government maintains a staff of native sanitary inspectors trained in the sanitary institute at Georgetown. These subordinate inspectors work under the direct supervision of a Chief Sanitary Inspector brought out from England. The staff engaged in sanitary improvement is entirely distinct from that engaged in examination and treatment, but both are under the direction of the Surgeon General. Laws are in existence requiring the erection of suitable latrines, but so far as possible the

voluntary coöperation of the people is relied upon for sanitary improvement.

Table 6 indicates that of the 6,147 homes inspected in the two districts where work was conducted, on the first inspection only 2,524, or 41.1 per cent, were found to be provided with latrines, whereas on the last inspection 3,918 homes, or 63.7 per cent of the total, had been provided. This means that during the progress of the work 1,394 new latrines were erected, and the sanitary work is still under way. (See Table 6, page 121.)

The table, however, does not show the actual extent of sanitary work conducted. In addition to the homes at which new latrines were erected, many other homes already provided with latrines were required to improve them to conform to the type adopted as standard. Main and interlot drains also were cleaned out; vats and barrels screened; dense overhanging bush and unnecessary vegetation cleared away; many unsanitary buildings removed; bakehouses and provision shops cleaned and re-constructed; accumulations of rubbish removed; and ventilation improved. In one district the villagers were so enthusiastic about the work and realized so well the benefits to be derived from it that they levied upon themselves an additional tax to pay for a special sanitary inspector.

As signifying the beneficial results following work for the relief and control of hookworm

TABLE 6: *British Guiana—Intensive Work: Sanitary Improvement from March 12, 1914, to December 31, 1915, by Areas.*

District	Number of Homes Inspected	NUMBER OF HOMES				PERCENTAGE OF HOMES			
		With Latrines		Without Latrines		With Latrines		Without Latrines	
		First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection
Total.....	6,147	2,524	3,918	3,623	2,229	41.1	63.7	58.9	36.3
Peter's Hall District.....	2,638	853	1,757	1,785	881	32.3	66.6	67.7	33.4
Belle Vue District.....	3,509	1,671	2,161	1,838	1,348	47.6	61.6	52.4	38.4

disease, the Surgeon General writes: "It may be of interest to know that from the Peter's Hall and Belle Vue districts, where the work has been conducted, the number of persons seeking medical relief at the public hospital at Georgetown has been much reduced, whereas from the city and from the country districts where the work has not been conducted the number has increased."

DUTCH GUIANA

Late in December, 1914, the Commission's Director for the West Indies on invitation visited Dutch Guiana and discussed with the Surgeon General and other members of the Colonial Medical Staff, plans for conducting measures against hookworm disease. Many estates and hospitals were inspected; clinical examination made of several hundred people; and every evidence found of a high rate of infection. The Colonial Government thereupon invited the Commission to aid in combating the disease, and in April, 1915, signified its readiness to have the work begin. Dr. W. H. Kibler was accordingly appointed Medical Officer in Charge of the work. He arrived at Paramaribo on October 2, and began active work on October 15, 1915.

The intensive method was selected for preliminary operations. A staff of one clerk, two microscopists, two nurses and two assistant nurses, and a caretaker was engaged to assist the director. The nurses and microscopists had received preliminary training in the military hospital at Paramaribo, making it possible to begin work without training these employees.

The Marienburg estate, located on the Comewyne river about ten miles from Paramaribo, was selected as the first district in which work

should be undertaken. This estate is the largest in the colony. It has a population of 2,380 persons, of whom 1,005 are Javanese, 894 East Indians, and 448 blacks. Both free and indentured labor is employed. The inhabited district on this estate covers less than one square mile.

The estate management has shown every courtesy to the director and other members of the staff, and has rendered valuable assistance in carrying on the work. An office and laboratory for the director was provided free of charge in the estate hospital, and living quarters for all members of the force were furnished at small cost. The estate has also furnished, for a greater part of the time, a man to assist the nurses in giving treatment.

Active work was begun on October 15 and was still in progress on December 31, 1915.

Examination and Treatment

Table 1 gives the total population of the Marienburg estate as 2,380 persons. Of these, 2,322, or 97.6 per cent, had been examined up to December 31, 1915; and 1,942, or 83.6 per cent of those examined, were found to be infected. First treatment had been administered to 1,809 persons—93.2 per cent of those infected; and 492, or 27.2 per cent of those receiving first treatment, had been cured.

TABLE I: *Dutch Guiana—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from October 15, 1915, to December 31, 1915.*

	MARIENBURG ESTATE	
	No.	P. C.
1. Census.....	2,380	....
2. Examined.....	2,322	97.6
3. Found Infected.....	1,942	83.6
4. Given First Treatment.....	1,809	93.2
5. Cured.....	492	27.2

In considering these figures it should be borne in mind that the work had not been completed by December 31, 1915. The number of infected persons remaining uncured will, of course, be reduced as the work progresses.

Educational Work

Before the work was undertaken, three preliminary meetings were held for interesting the people; a fourth was held after the work was under way. Two of the meetings were for the East Indians, one for the Javanese, and one for the negroes. All were well attended, the attendance at the four being 2,500 persons. Three of the lectures were illustrated by lantern slides. At one of the meetings the Governor, the Surgeon General, and a number of prominent citizens of Paramaribo were in attendance,

Sanitary Improvement

As the work of examination and treatment progresses, the estate management is bringing about the necessary sanitary improvement. In a survey conducted at the beginning of the work it was found that of 201 houses located on the estate, 143, or 71.1 per cent, were emptying their sewage into trenches, some of which had water in them only during the rainy season and others only during the period when the sugar factory was running. The remaining 58 homes, or 28.8 per cent of the total, had no provision for sewage disposal and were contaminating the soil. Up to December 31, 1915, seven new latrines had been built to provide accommodations for 27 houses, so that by December 31, 1915, the number of houses without latrines had been reduced to 34, or 16.9 per cent of the total, and the number disposing of their sewage into trenches to 140, or 69.7 per cent of the total. Sanitary work in the area is still in progress.

GRENADA

Operations against hookworm disease in Grenada are in charge of Dr. Angus Macdonald, who works under the direction of the Surgeon General, with the assistance of a local Advisory Committee. Besides the medical officer in charge, the staff consists of the assistant medical officer, one clerk, five microscopists, and a varying number of nurses and assistant nurses.

The work may be said to be conducted by the dispensary plan. At first the widely scattered population and the agricultural pursuits of the people seemed to make it quite out of the question to attempt the thoroughgoing house-to-house visitation and treatment which characterizes the intensive method. Lately it has been found possible, by reducing the size of the areas, to approach more nearly the intensive plan of work. But the technique of microscopic examination still differs from that usually employed in intensive work, the nurses do not oversee the actual taking of the medicine in the homes of the patients, and considerable latitude is left for the patient to exercise his own judgment. For these reasons the Grenada work is classified throughout this report as being rather of the dispensary than of the intensive type.

Active measures were begun on December 1, 1914, with the central office located at St. George's and branch laboratories at Mt. Moritz,

Guoyave, Birch Grove, and St. Dominic's, to which people were invited to come for free diagnosis and treatment. This plan of work was followed until February, 1915, when it was decided to restrict the field of operations to two areas: the first, known as the Mt. Moritz area, embracing about 7,000 acres in the parish of St. George's; and the second, known as the St. David's area, embracing about 12,000 acres in the parish of St. David's. Work in these two districts continued to engage the attention of the staff until July, 1915, when work was begun in another area located in the parish of St. Andrew's, contiguous on its southern boundary with the area previously worked in St. David's. The St. Andrew's area covers about 6,000 acres. The population to be handled was purposely limited to about 2,000, so that a closer approach to the intensive method might be made than was found possible in the other districts. Work in the St. Andrew's area was still in progress on December 31, 1915. In each of the old areas the work was not closed abruptly when operations were begun in a new area; instead, considerable effort was made to continue the treatment of all persons in these areas who had not yet been cured.

These three areas combined embrace approximately one-third of the total area of the island and about one-sixth of the population. In the Mt. Moritz and St. David's districts there are

few estates of any size—the people are mainly renters and small holders; but in the St. Andrew's area large estates give labor to the bulk of the people, most of whom live on the hills above the estates. For the Mt. Moritz area the head office at St. George's was the headquarters; and for the St. David's area the Government Rest House in St. David's. In November, premises were secured for the staff at a central point in St. Andrew's parish and headquarters were established there for the work in that area.

Each area was sub divided into districts, in each of which a school or barn served as a convenient center for receiving patients, examining them personally, collecting their specimens, and giving them treatment. In general, house-to-house examination and distribution of medicine has not been carried out. The visits of the medical officers to the homes have been mainly educational or for purposes of general investigation.

Examination and Treatment

The results of the work of examination and treatment are exhibited in Table 1. The total population dealt with up to December 31, 1915, was 16,001. The actual number of persons examined is not known, as the early records kept for the work of examination at the head office and in the Mt. Moritz and St. David's

areas related to the number of specimens and not to the number of persons. The number of specimens microscopically examined was 18,584, of which 11,194, or 60.2 per cent, were found positive. First treatment was administered to 11,522 persons—328 in excess of the number of specimens found positive. In the early days of the work the acknowledged possibility of faulty diagnosis and the investigation of the action of drugs on other parasitic conditions made it seem advisable to treat many who were recorded as not infected. The actual number of persons treated to a cure as demonstrated by microscopic examination was 3,346, or 29.9 per cent of those who received first treatment. Figures in detail for each area are given in the table. (See Table 1, page 131.)

The cocoa-growing districts, with their continuous shade and almost persistent moisture, are the chief centers of infection. A comparison of the percentage of infection found in the Mt. Moritz area, wherein the cultivation is largely open, with that found in the St. David's and St. Andrew's areas, where dense cocoa cultivation prevails, shows that in the first area only 45 persons of every 100 were infected, whereas in the other two areas the average was 67. Of the last two areas, the percentage of infection in St. David's was higher than in St. Andrew's, being 72 as compared with 59 per cent.

TABLE 1: Grenada—Dispensary Work: Number of Specimens Examined and Found Positive, and Number of Persons Given First Treatment and Cured, from December 1, 1914, to December 31, 1915, by Areas.

	TOTAL		MOUNT MORITZ		SAINT DAVID'S		SAINT ANDREW'S		SAINT ANDREW'S OFFICE		HEAD OFFICE	
	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.	No.	P.C.
1. Persons Enumerated in Census.....	16,001	....	4,065	....	6,425	....	2,000	....	85	....	3,426	....
2. Specimens Microscopically Examined.....	18,584	....	4,170	....	6,446	....	4,628	....	85	....	3,255	....
3. Specimens Positive.....	11,194	60.2	1,890	45.3	4,652	72.2	2,732	59.0	69	81.2	1,851	56.9
4. Persons Given First Treatment.....	11,522	....	1,897	....	5,259	....	1,602	....	69	....	2,695	....
5. Persons Cured.....	3,346	....	1,156	....	759	....	509	....	..	....	922	....

Educational Work

Illustrated lectures and demonstrations under the microscope were delivered regularly throughout the areas, and the schools were widely used for general publicity work. In the Mt. Moritz and St. David's areas teachers were employed as part-time assistants. They took the census, distributed medicine, and showed much interest in the educational features of the work. Literature has also been freely distributed and as often as possible has been read to the people. In this way the educational activities have been kept persistently in the foreground.

Table 2 gives an idea of the extent and nature of educational work conducted by means of lectures, and shows the number of persons who were in attendance.

TABLE 2; *Grenada—Dispensary Work: Number of Lectures Delivered from December 1, 1914, to December 31, 1915, with Attendance.*

	No.
Lectures to schools, estates, and teachers.....	89
Attendance on lectures to schools, estates, and teachers	26,700
Lectures at locations.....	(Daily)
Attendance on lectures at locations.....	38,422

Sanitary Improvement

The Government attends to the sanitary improvement. In the work conducted in the parishes of St. George's and St. David's only one san-

itary inspector, working under the direction of the Colonial Surgeon, looked after the sanitary necessities of approximately 10,000 people. Since work was begun in the St. Andrew's area, however, three additional sanitary inspectors have been appointed to carry out general sanitary work, and especially to instruct the people in legal requirements for disposing of human excrement.

In all areas where work has been conducted, the people have shown a ready response and an almost universal disposition to provide themselves with latrines, but in many cases, lacking the practical guidance that might be had from a few well-constructed latrines located at convenient centers, have built latrines that are not adequate for preventing soil pollution during all seasons of the year. The Government is deeply interested in this question and has recently enacted laws and regulations governing the disposal of human excrement. It may therefore be expected that latrines conforming more nearly to the type recommended by the local Advisory Committee will soon be installed throughout the Island.

ST. LUCIA

Operations against hookworm disease in St. Lucia are in charge of Dr. Stanley Branch, who serves under the general direction of an Advisory Committee appointed by the Island Government. Dr. Branch began active work on November 20, 1914, and up to December 31, 1914, conducted a preliminary investigation into the distribution and prevalence of the infection. In this investigation, 750 persons taken at random were examined, and 512, or 68.3 per cent, were found to be infected.

Beginning January 1, 1915, work was conducted along the general lines of the intensive method as followed in other West Indian colonies. In the St. Lucia work, however, there were two important points of difference: before work was begun, no inaugural meeting attended by Government officials and prominent citizens was held for the purpose of interesting the people and gaining their coöperation; nor, when treatment was administered, were the nurses required to oversee the actual taking of the medicine in every case.

A staff of two microscopists, three nurses, three assistant nurses, and a clerk was engaged to assist the director. Headquarters were established in the town of Castries, but the nurses and microscopists lived and worked in the areas where the work was conducted.

The Cul-de-Sac Valley was selected for preliminary operations. In this area work was conducted from January 1 to June 30, when work was begun in another area, located in the Castries Valley. Here work was in progress until December 31, 1915.

The Cul-de-Sac Valley is almost entirely rural. Dense masses of tropical vegetation grow throughout the area, and on the flatter lands there is extensive cultivation of cane intermixed with crops of cocoa and limes. A large sugar company maintains a factory here. Ciceron is the only village; elsewhere, the houses are so scattered that it has taken hours to visit five or six homes on horseback and get back to the nearest road.

The Castries Valley area is naturally divided into two portions: one wholly urban, the other suburban; with the suburban area further divided into ten different localities. The population in the Castries Valley is much more compact and therefore easier to handle. More than one-half of the people live within the town of Castries itself.

Examination and Treatment

In the two areas where work was conducted up to December 31, 1915, there was a population of 8,149 persons. Of these, 7,924, or 97.2 per cent, were examined; and 4,436, or 56.0 per cent of those examined, were found to be infected. First treatment was administered to 4,106, or 92.6

per cent of the infected persons; and 2,177, or 53.0 per cent of those given first treatment, were shown by microscopic re-examination to have been cured. Table 1 exhibits these figures in detail for each area.

TABLE 1: *St. Lucia—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from January 1, 1915, to December 31, 1915, by Areas.*

	NUMBER OF PERSONS			PERCENTAGE OF PERSONS		
	Total	Castries Valley	Cul-de-Sac Valley	Total	Castries Valley	Cul-de-Sac Valley
1. Census.....	8,149	4,648	3,501	....	....	....
2. Examined.....	7,924	4,501	3,423	97.2	96.8	97.8
3. Found Infected....	4,436	1,598	2,838	56.0	35.5	82.9
4. Given First Treatment.....	4,106	1,488	2,618	92.6	93.1	92.2
5. Cured.....	2,177	1,119	1,058	53.0	75.2	40.4

The results of the work during the second half of the year were considerably better than during the first, as a comparison of figures for the two areas will show. In the area worked during the first half of the year, only 37.3 per cent of the infected persons were cured (see Table 2, page 137), while in that worked during the second half, 70.0 per cent were cured.

Statistics show that of the 1,647 infected persons who remained uncured in the first area,

220 were persons who refused to accept the first treatment, while 1,427 were persons who accepted the first treatment but did not continue treatment until cured. Of the 1,427 who received one or more treatments, 1,004, or 70.4 per cent, received less than three treatments; while 423, or 29.6 per cent, received three or more treatments. The failure to cure the majority of these 1,427 persons was not due to direct abandonment of treatment by them, but rather to the fact that six months did not prove to be a period of time sufficiently long to overcome their procrastinating habits. In a large number of cases, re-examination, if it could have been made, would doubtless have shown that cures had been effected.

Table 2 presents a brief summary showing the number of infected persons who remained uncured in each area at the close of work:

TABLE 2: *St. Lucia—Intensive Work: Number of Persons Remaining Uncured in Areas Worked from January 1, 1915, to December 31, 1915.*

	Total		Castries Valley		Cul-de-Sac Valley	
	No.	P.C.	No.	P.C.	No.	P.C.
1. Infected.....	4,436	....	1,598	....	2,838	....
2. Cured.....	2,177	49.1	1,119	70.0	1,058	37.3
3. Removed.....	303	6.8	170	10.6	133	4.7
4. Remaining in Area Uncured.....	1,956	44.1	309	19.3	1,647	58.0
(a) Not cured for medical reasons....	27	....	27	....	....	....
(b) Refused treatment.....	1,735	....	88	....	1,647	....
(c) Under treatment.	194	....	194	....	....	....

Table 3 presents figures in detail covering the work of examination and treatment, and gives the supporting figures upon which Tables 1 and 2 are based. (See Table 3, page 139.)

Educational Work

The central office at Castries serves as headquarters for educational work. This office is open to the public during working hours, and people come from all parts of the Island for consultation. Individual lectures illustrated with charts and demonstrations of the ova and living embryos under the microscope are given. Lectures and demonstrations have been held in all primary schools in Castries and effort made to gain the sympathetic coöperation of managers and teachers, so that through them the active interest of the school children might be enlisted. A lecture was also delivered to the police force in Castries.

Sanitary Improvement

It has never been the custom in St. Lucia to build latrines or even to make any general use of commodes. The almost invariable practice of the native population is to use earthenware utensils of varying kinds and sizes, the contents of which are either dumped into a covered pail for subsequent disposal or the vessel itself covered with an ill-fitting piece of wood and put aside until, under cover of darkness, its

TABLE 3 : *St. Lucia—Intensive Work: Detailed Results of Examination and Treatment from January 1, 1915, to December 31, 1915, by Areas.*

	NUMBER OF PERSONS		
	Total	Castries Valley	Cul-de-Sac Valley
1. Census.....	8,149	4,648	3,501
2. Examined.....	7,924	4,501	3,423
3. Not Examined.....	225¹	147	78
(a) Not traced.....	1	1	.....
(b) Removed.....	66	66	.....
(c) Died.....	4	4	.....
(d) Refused.....	76	76	.....
4. Found Infected.....	4,436	1,598	2,838
5. Given First Treatment ...	4,106	1,488	2,618
6. Not Given First Treatment...	330	110	220
(a) Removed.....	49	49	.....
(b) Died.....	2	2	.....
(c) Refused.....	261	41	220
(d) Medical reasons.....	18	18	.....
(e) Not located.....	.....	.....	.....
7. Cured.....	2,177	1,119	1,058
8. Given First Treatment but not Cured.....	1,929	369	1,560
(a) Not located.....	.....	.....	.....
(b) Refused.....	1,474	47	1,427
(c) Medical reasons.....	9	9	.....
(d) Removed.....	249	116	133
(e) Died.....	3	3	.....
(f) Under treatment.....	194	194	.....

¹ There is a difference of 78 between the figures reported in this column for "Not Examined" and the addition of the figures reported by the sub-headings "Not Traced," "Removed," "Died," and "Refused." For the Cul-de-Sac Valley the total number of persons "Not Examined" was reported, but this total was not classified by sub-headings as in the Castries Valley.

contents can be thrown away. It has not been found an easy matter to overcome this practice. Even in some cases where the people have been persuaded to install latrines, these are used only as a place into which the vessels may be emptied.

Within the town of Castries water sewerage is impracticable; consequently a system of removal by pails is in use. A sewage barge anchors nightly in the river, and all night long the inhabitants parade to the barge with their receptacles of sewage matter. On the nights of November 2-3 and 3-4, 1915, both fine and clear, the number of receptacles taken to the barge was 438 and 560, respectively—an average of 499 per night. By the census of 1911 the population of Castries was 6,266; the number of inhabited houses, 1,329. Assuming that all of the receptacles were brought from homes within the limits of the town, this means one receptacle to every two and one-half inhabited houses, or one to every twelve and one-half persons, indicating that at only 40 per cent of the homes within the town limits is effort made to secure a satisfactory disposal of the sewage. But there are many householders within or near the outskirts of the town who claim that they also make use of the sewage boat; in the area where work was conducted, twenty-seven families made this claim. If the number of receptacles taken to the boat by these out-of-town families should be deducted

from the average of 499, the number of houses or persons per receptacle within the town limits would be still higher.

Early in September the Board of Health passed a series of regulations to prevent soil pollution. Two nurses were temporarily assigned to make a survey of sanitary conditions in the rural portion of the area and to endeavor to have latrines installed at every home. Beginning January 1, 1916, these nurses will return to their regular duties of treating the infected, and a special inspector will be employed to devote his whole time to the work of sanitary improvement.

Between September 1 and December 31, 1915, each householder was interviewed personally, a copy of the regulations was given or read to him, and effort was made to persuade him to build a latrine. This was the first organized attempt ever made in St. Lucia to cope with soil pollution. The results have been particularly encouraging: the people have taken kindly to the idea, no legal prosecutions have been necessary, and in certain districts new latrines have been erected even before the work of examination and treatment was under way.

Table 4 exhibits the results accomplished in sanitary work up to December 31, 1915. It indicates that among 419 homes in the suburban portion of the area, on the first

inspection only 20, or 4.8 per cent, were provided with adequate means of sewage disposal, as compared with 119, or 28.4 per cent, on the last inspection. In addition to this, latrines were in process of erection at 62 other homes, bringing the number of homes either provided or to be provided with latrines to 181, or 43.2 per cent of the total.

TABLE 4: *St. Lucia—Intensive Work: Sanitary Improvement at Rural Homes from January 1, 1915, to December 31, 1915.*

(Homes Outside of Town of Castries)	No.	P. C.
1. Homes Inspected.....	419	....
2. Homes with Adequate Disposal:		
(a) First Inspection.....	20	4.8
(b) Last Inspection.....	119	28.4
3. Homes without Adequate Disposal:		
(a) First Inspection.....	399	95.2
(b) Last Inspection.....	300	71.6

Table 5 presents a summary of the conditions found at the 419 homes listed in Table 4. It will be seen that among the 399 homes found to be without adequate sewage disposal on the first inspection, 52 were discharging their waste matter into an uncovered cesspool; 65 into a covered cesspool; 180 were depositing it on the surface or into a ravine or gorge; 27 claimed the use of a sewage boat; and 75 were throwing their refuse into the sea on the fore-shore.

TABLE 5: *St. Lucia—Intensive Work: Comparison of Sanitary Conditions at Rural Homes in September, 1915, and in December, 1915.*

METHOD OF DISPOSAL	Condition existing at date of survey in September, 1915. (Homes outside of town of Castries.)	CONDITION EXISTING DECEMBER 31, 1915		
		No Change	Latrines Built	Latrines in process of building; many actually in use.
Homes Inspected.....	419	258	99	62
Satisfactory disposal by burial, latrine accommodation, or undoubted use of the sewage boat	20	20	..	..
Uncovered cesspool.....	52	23	19	10
Covered cesspool.....	65	27	21	17
Surface, ravine, river, or gorge.	180	99	51	30
Claiming the use of sewage boat	27	20	4	3
Thrown into the sea on the fore-shore.....	75	69	4	2

A joint commission of representatives of the General Board of Health and of the Castries Town Board has been appointed by the Administrator to recommend the most satisfactory and economical method of disposing of sewage in Castries and in its vicinity. As the work of sanitary reform, backed by legislative authority, proceeds along with the further treatment and education of the people, it may be expected that ultimately the general sanitary conditions of the Island will be greatly improved and soil pollution prevented.

ST. VINCENT

Early in 1914, Dr. C. H. Durrant, the Colonial Surgeon, was appointed to direct measures for the relief and control of hookworm disease in St. Vincent. The work was not begun immediately, however, because the Government could find no successor to relieve Dr. Durrant of his hospital duties. In February, 1915, the Governor of the Windward Islands asked the Commission to appoint a director temporarily in lieu of Dr. Durrant. Dr. W. P. Jacocks was accordingly detailed for the work. He arrived in St. Vincent in April, 1915, and began active work on May 1.

The intensive method of work was adopted and a staff of two microscopists, two nurses, two assistant nurses, and one caretaker was engaged.

Up to December 31, 1915, operations had been completed in two districts: Calliaqua and Belair. Calliaqua, the first district worked, is located three miles from Kingstown, the capital. Its base extends four miles along the seacoast and its legs reach three miles inland, meeting at Belmont. The boundaries (roads, rivers, and the sea) are well defined. Headquarters were established in the town of Calliaqua, on the seacoast. The territory embraced in the area consists of three valleys separated by high and steep ridges. Practically all of the land is under

cultivation. The people live here and there in collections of villages (for example, Choppins and Brighton), but with this exception the homes are very scattered. During the rainy season, from April to December, it was a problem to pass from one home to another when these homes were not on the main road. Besides, many of the people were field laborers who left home early and returned late; to interview them required visits at unreasonable hours, before daybreak or after dark.

The second area, Belair, adjoins the first. This whole district is inland, the nearest sea-coast being about two miles away. In the Belair district the great majority of the inhabitants live in seven small villages, with a few homes scattered here and there upon the sides of the surrounding hills and mountains.

There is no indentured labor in either district; in both, the people were found to be amenable to suggestion and anxious to coöperate.

Examination and Treatment

In both the Calliaqua and Belair areas particularly gratifying results were obtained in the work of examination and treatment. In the Calliaqua area not one person refused to be examined—a record for the work to date. In the Belair area, only three refused to submit specimens. More than this, only eight persons in the Calliaqua area refused to continue treat-

ment until cured, and in the Belair area only twenty-two.

Out of a total of 3,825 persons living in both areas, 3,822, or 99.9 per cent, were microscopically examined, and 1,676, or 43.9 per cent of those examined, were found to be infected. First treatment was administered to 1,590 persons, 94.9 per cent of those infected; and 1,350 persons, 84.9 per cent of those receiving first treatment, were kept under treatment until cured. Figures for each district are shown in Table 1.

TABLE 1: *St. Vincent—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from May 1, 1915, to December 31, 1915, by Areas.*

	NUMBER OF PERSONS			PERCENTAGE OF PERSONS		
	Total	Calliaqua	Belair	Total	Calliaqua	Belair
1. Census.....	3,825	2,544	1,281	....	....	....
2. Examined.....	3,822	2,544	1,278	99.9	100.0	99.8
3. Found Infected...	1,676	801	875	43.9	31.5	68.5
4. Given First Treatment.....	1,590	773	817	94.9	96.5	93.4
5. Cured.....	1,350	627	723	84.9	81.1	88.5

Of the 1,676 persons who were infected, 326, or 19.5 per cent, remained in the areas uncured

at the close of the work. Of these, 219 were persons who had not been treated a sufficient number of times for a cure to be effected; 30 refused to be cured; and 75 could not be treated for medical reasons. Two persons lived in remote places and were unwilling to remain at home for treatment except on Sundays, when all the nurses were busy in the more populous districts; therefore, they could not be treated. The following statement is a brief summary of the

TABLE 2: *St. Vincent—Intensive Work: Detailed Results of Examination and Treatment from May 1, 1915, to December 31, 1915, by Areas.*

	NUMBER OF PERSONS		
	Total	Calliaqua	Belair
1. Census	3,825	2,544	1,281
2. Examined	3,822	2,544	1,278
3. Not Examined.....	3	....	3
(a) Refused.....	1	....	1
(b) Removed before examination	2	....	2
4. Found Infected	1,676	801	875
5. Given First Treatment	1,590	773	817
6. Not Given First Treatment.....	86	28	58
(a) Medical reasons.....	75	28	47
(b) Refused.....	9	....	9
(c) Inaccessible.....	2	....	2
7. Cured	1,350	627	723
8. Given First Treatment but not Cured.....	240	146	94
(a) Refused.....	21	8	13
(b) Under Treatment.....	219	138	81

results of treatment, based upon the figures given in Table 2. (See Table 2, page 147.)

	No.	P. C.
1. Infected.....	1,676	....
2. Cured.....	1,350	80.5
3. Remaining in area uncured.....	326	19.5
(a) Under treatment.....	219	
(b) Not cured for medical reasons.....	75	
(c) Refused treatment.....	30	
(d) Inaccessible.....	2	

Educational Work

Before any work was begun the usual public meetings were held. Table 3 shows the number of school and public lectures delivered in both the Calliaqua and Belair areas, with the total attendance at lectures of both classes:

TABLE 3: *St. Vincent—Intensive Work: Number of Lectures Delivered from May 1, 1915, to December 31, 1915, with Attendance.*

	Total	Calliaqua	Belair
1. Total Lectures.....	11	7	4
(a) School lectures.....	7	4	3
(b) Public lectures.....	4	3	1
2. Attendance at Lectures.....	2,062	1,287	775
(a) School lectures.....	862	387	475
(b) Public lectures.....	1,200	900	300

Sanitary Improvement

The Government of St. Vincent maintains a staff engaged in securing the necessary sanitary improvement. In the two areas where work was

conducted up to December 31, 1915, there were 736 homes. On the first inspection only 86, or 11.7 per cent, were found to be provided with latrines. While the work of examination and treatment was in progress, 348 new latrines were built in these areas, so that on December 31, 1915, when the work of examination and treatment ended, the number of homes provided with latrines was 434, or 59.0 per cent of the total homes. This does not necessarily mean that the remaining 41.0 per cent have no latrine accommodation. In a great many instances, where the families are small, one latrine provides accommodation for two or three families.

Table 4 presents a brief comparison of the number of homes with latrines on the first and last inspections.

TABLE 4: *St. Vincent—Intensive Work: Sanitary Improvement from May 1, 1915, to December 31, 1915, by Areas.*

DISTRICT	Number of Homes Inspected	NUMBER OF HOMES				PERCENTAGE OF HOMES			
		With Latrines		Without Latrines		With Latrines		Without Latrines	
		First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection	First Inspection	Last Inspection
Total.....	736	86	434	650	302	11.7	59.0	88.3	41.0
Calliaqua.....	518	78	396	440	122	15.1	76.4	84.9	23.6
Belair.....	218	8	38	210	180	3.7	17.4	96.3	82.6

The sanitary work was delayed at the start, and did not keep pace with the work of treatment and cure. It will undoubtedly continue, however, until practically every home has been provided with satisfactory sanitary conveniences.

TRINIDAD

The work for the relief and control of hook-worm disease in Trinidad is conducted as a department of the Government Medical Service under the supervision of the Surgeon General. Both the dispensary and intensive plans of work have been followed. Col. J. R. Dodd, M.D., D.P.H., was appointed Medical Officer in Charge June 13, 1914, and served until January 19, 1915. From January 20, 1915, until November 8, 1915, Dr. C. G. H. Campbell, M.B., B.A., was Acting Medical Officer in Charge, assisted from March 6, 1915, to November 8, 1915, by Dr. B. E. Washburn, M.A., M.D. From November 8, 1915, to December 31, 1915, Dr. Washburn has been Medical Officer in Charge.

Preliminary operations were conducted under the dispensary plan, with headquarters at San Fernando and branch laboratories at Couva, Princes Town, and La Brea. Active work under this plan was begun on August 11, 1914, and continued until January 1, 1915, when it was decided to restrict the field of operations and to attempt experimental work under a modification of the intensive plan, in the hope that the experience gained might make feasible a still closer approach to the intensive work in the next areas to be undertaken. For this experimental intensive work the Ste. Madeleine area was selected. This area was located near San Fernando, and

embraced, besides Ste. Madeleine, the six adjoining villages of Jaipal, Coylas, St. Charles, Ne Plus Ultra, Mon Repos, and Cocoye. Work in this area continued from January 15 to May 15, 1915. Besides the acting medical officer in charge and the assistant medical officer, the staff consisted of one clerk, three nurses, two microscopists, and one caretaker. Because the work in this area was not, properly speaking, of the intensive type, it is classified throughout this report as dispensary work.

Examination and Treatment: Dispensary Method

Figures for the dispensary work conducted with headquarters at San Fernando, and for the modified intensive work later conducted at Ste. Madeleine, are presented separately in Table I. This shows that a total of 10,204 persons were examined, of whom 6,127, or 60.0 per cent, were found to be infected. First treatment was administered to 4,527 persons—73.9 per cent of those infected—and 526, or 11.6 per cent of those receiving first treatment, were shown by microscopic re-examination to have been cured. (See Table I, page 153.)

Examination and Treatment: Intensive Method

On May 15, 1915, operations under the intensive plan were begun in the village of Tunapuna and its environs. Tunapuna is a village of 6,498 inhabitants, located about nine miles

TABLE 1: *Trinidad—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from August 11, 1914, to April 30, 1915, by Areas.*

	NUMBER OF PERSONS				PERCENTAGE OF PERSONS			
	Total	San Fernando	Ste. Madeleine	Miscellaneous ¹	Total	San Fernando	Ste. Madeleine	Miscellaneous
1. Examined..	10,204	7,368	1,794	1,042	....	....	....	....
2. Found Infected...	6,127	4,528	957	642	60.0	61.5	53.3	61.6
3. Given First Treatment	4,527	3,463	933	131	73.9	76.5	97.5	20.4
4. Cured.....	526	341	172	13	11.6	9.8	18.4	9.9

from Port-of-Spain, the capital. It is the center of a densely populated area, about 60 per cent of the inhabitants being Creoles and 40 per cent East Indians. There are no indentured laborers. The village and surrounding territory were divided into eighteen districts, in thirteen of which the work had been completed by December 31, 1915. The area is bounded on the north by a range of mountains, and on the south by a river. It is about two and a half miles long, and at no point more than a mile

¹ Since the intensive work was begun in the Tunapuna area and the offices at San Fernando and Ste. Madeleine closed, a number of incidental examinations have been made and treatments given to persons residing outside of the Tunapuna area. These incidental examinations and treatments are reported in Table 1 under the head of "Miscellaneous."

in width. Besides Tunapuna, six small villages were included. The staff employed in this area consisted of the medical officer in charge, three clerks, nine nurses, three microscopists, and one caretaker.

In the thirteen districts in which work had been completed up to December 31, 1915, there were, at the beginning of work, 6,498 inhabitants. Of these, 5,943, or 91.5 per cent, were microscopically examined; and 4,000, or 67.3 per cent, were found to be infected. Of the 4,000 persons infected, 3,632, or 90.8 per cent, were given first treatment; and 2,712, or 74.7 per cent of those receiving first treatment, were shown by microscopic re-examination to have been cured.

This information is presented in tabular form in Table 2.

TABLE 2: *Trinidad—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from May 15, 1915, to December 31, 1915.*

	No.	P. C.
1. Census.....	6,498	....
2. Examined.....	5,943	91.5
3. Found Infected.....	4,000	67.3
4. Given First Treatment.....	3,632	90.8
5. Cured.....	2,712	74.7

Of the 4,000 infected persons shown in Table 2, it will be seen that 2,712, or 67.8 per

cent, were cured. It should not be assumed from this that the other 1,288 persons, or 32.3 per cent of those found infected, remained in the Tunapuna area uncured at the close of work. Of these 1,288 infected persons, 530 removed from the area while the work was in progress, leaving only 758 uncured persons in the area at the close of the work. Two hundred twenty-two of these could not be cured for medical reasons, and 536 refused to be treated.

The following summary presents a brief statement showing the number of infected persons remaining in the area uncured.

	<u>No.</u>	<u>P.C.</u>
1. Infected	4,000	....
2. Cured.....	2,712	67.8
3. Removed.....	530	13.3
4. Remaining in area uncured.....	758	19.0
(a) Refused.....	536	
(b) Not cured for medical reasons.....	222	

Table 3 exhibits figures in detail showing the results of examination and treatment. (See Table 3, page 156.)

Educational Work

From an educational standpoint, both the dispensary and the intensive work have been very thorough. In Table 4 a brief summary is presented of the number of lectures delivered in each area, with the average attendance at each. (See Table 4, page 157.)

TABLE 3: *Trinidad—Intensive Work: Detailed Results of Examination and Treatment from May 15, 1915, to December 31, 1915.*

Tunapuna Area	Number of Persons
1. Census.....	6,498
2. Examined.....	5,943
3. Not Examined.....	555
(a) Not traced.....	2
(b) Removed.....	399
(c) Died.....	11
(d) Refused.....	143
4. Found Infected.....	4,000
5. Given First Treatment.....	3,632
6. Not Given First Treatment.....	368
(a) Removed.....	112
(b) Died.....	4
(c) Medical reasons.....	175
(d) Refused.....	77
7. Cured.....	2,712
8. Given First Treatment But Not Cured.....	920
(a) Refused.....	459
(b) Removed.....	410
(c) Medical reasons.....	47
(d) Died.....	4

To acquaint the people still further with the scope and purpose of the work, a booth was engaged at the exhibition of the Agricultural Society of Trinidad and Tobago on February 26, 27, and 28, 1915. Pamphlets and literature were here distributed, diagrams and charts displayed, and specimens of hookworm and other parasitic worms exhibited.

TABLE 4: *Trinidad—Intensive Work: Number of Lectures Delivered from January 1, 1915, to December 31, 1915, with Attendance.*

	Total	Ste. Madeleine	Tunapuna
1. Total Lectures.....	45	29	16
(a) Public.....	21	15	6
(b) School.....	8	5	3
(c) Special.....	16	9	7
2. Attendance at Lectures.....	7,759	4,536	3,223
(a) Public.....	6,400	3,700	2,700
(b) School.....	1,041	650	391
(c) Special.....	318	186	132

Sanitary Improvement

The Government on its part undertakes to inaugurate such sanitary changes and improvements as will reduce to a minimum the dangers of re-infection. Laws are in existence for compelling sanitary improvement where necessary, and a sanitary staff working under the direction of the warden is entrusted with the proper enforcement of these laws.

In the Tunapuna district there are 1,146 homes. All but 31 of these, or 97.3 per cent, now have sanitary latrines, and efforts are being made to have latrines erected at the remaining 31 homes. At the Orphanage and Industrial School all the buildings are supplied with latrines of the pail type. These are kept in good

condition and render the inmates safe from infection. In districts such as Tunapuna, where the existing infection is reduced to a minimum and is followed by adequate sanitary precautions, the ultimate complete disappearance of the disease can be prevented only by its being re-introduced from other quarters or by a failure properly to maintain the sanitary precautions which have been established.

COSTA RICA

In the first annual report a brief account is given of the opening of work in Costa Rica, together with a summary of the results accomplished up to December 31, 1914. On November 30, 1914, Dr. Louis Schapiro was appointed Director of the work in Costa Rica, to succeed Dr. Henry R. Carter, Jr. Dr. Schapiro arrived in Costa Rica on December 16, 1914, and at once assumed active direction of the work. The staff consists of an assistant director, a clerk, three field directors, and four microscopists, termed technical assistants. Headquarters are in the city of San Jose.

Regulations establishing the work as an integral part of the Government machinery, under the direction of the Minister of Police, were enacted April 8, 1915. Under these regulations the work is officially designated as the Department of Ankylostomiasis, and all official doctors, governors, chiefs of police, and agents of police throughout the Republic are obliged to support the work not only in all phases relating to examination and treatment, but more especially in matters relating to sanitary improvement. Householders are required to construct latrines satisfactory to the Department of Ankylostomiasis under penalty of fine or imprisonment, and in cases where refusals are met the Government will construct the privies and charge the expense

plus a fine to the owner of the house. The Government will build privies for persons too poor to bear this expense. Members of the staff of the Department of Ankylostomiasis are clothed with police powers to compel compliance with the sanitary regulations. Reports are made monthly to the Secretary of Police.

The dispensary plan is followed, the canton or county being the unit of operations. Three laboratories operate in the field and one at the central office. In each canton, districts convenient to the bulk of the population are selected and laboratories established in them. To these laboratories the people are invited to come for free examination and treatment. The police authorities are advised in advance when a laboratory is to be opened in a new district, and are furnished with census books, in which they record every house and take a census of each inhabitant, including information as to age, sex, race, occupation, and the conditions of sewage disposal at each home. When the laboratory arrives the census is checked by the technical assistants, talks are given in the homes, containers distributed, and arrangements made for a public meeting. On the day following this meeting the laboratory is opened. During the first months the outlying villages are studied and arrangements made for visits to each section on different dates by an ambulant laboratory. Effort is made to visit each home at least once a

month, in order that the progress of latrine construction may be noted and the patients urged to return to the laboratory for examination to determine whether or not they have been cured. Owing to the bad roads into the interior, the districts most distant from the central tableland are worked during the dry season, and those close to the railroads during the wet season. This necessary shifting of laboratories has its drawbacks, in that at times a dispensary must be withdrawn from a district just when the people in this and adjoining districts are awakening to the positive benefit to be derived from the work.

During the school year every pupil in the districts where the laboratories are operating is examined and re-examined until the infected have been cured.

Up to December 31, 1914, operations had been conducted in two cantons located in the extreme northern section of the province of Puntarenas, on the Pacific side of the country. During 1915, the work was extended to include the other six provinces. The names of the provinces and cantons in which work has been conducted are listed in Table 2, page 164. It should not be inferred that the whole area of any of these provinces has been covered, nor that the work in any of them has been completed, but simply that the most favorable points of attack have been selected and a beginning made

from which, in course of time, it may be possible to cover the whole inhabited area of each province.

Examination and Treatment

In districts where work has been conducted, the total population as enumerated by the staff of the Department of Ankylostomiasis is 81,515. The actual number of persons examined up to December 31, 1915, is not known; the figures furnished for results of examination have related to the number of microscopic examinations made and not to the number of persons examined. In some cases three, four, or more specimens may be examined from one person. In certain districts, therefore, the figures for the number of examinations exceed the total population. A record has been kept of the number of persons examined, and as the work in each district is closed this information will be obtained from the books and embodied in the final reports.

Up to December 31, 1915, the total number of specimens examined was 62,391—57,979 during 1915 and 4,412 during 1914. Of these specimens, 38,181, or 61.2 per cent, were found to be positive. First treatment was administered to 26,938 persons, or 33.0 per cent of the total population residing in the districts where work was conducted. Table I gives the total figures up to December 31, 1915, showing the results of examination and treatment, with figures for 1914 and 1915 presented separately.

TABLE 1: *Costa Rica—Dispensary Work: Number of Specimens Microscopically Examined and Found Positive, and Number of Persons Given First Treatment, from September 23, 1914, to December 31, 1915.*

With Comparison of Results During 1915 and During 1914.

	UP TO DECEMBER 31, 1915		DURING 1915		DURING 1914	
	No.	P.C.	No.	P.C.	No.	P.C.
1. Population.....	81,515	....	81,515	....	....	....
2. Microscopic examinations made.....	62,391	....	57,979	....	4,412	....
3. Microscopic examinations positive.....	38,181	61.2	34,840	60.1	3,341	75.7
4. Persons receiving first treatment.....	26,938	....	23,597	....	3,341	....

Table 2 itemizes by provinces and cantons the results accomplished during 1915. (See Table 2, page 164.)

Educational Work

An extensive campaign of education has been conducted through the public schools, the press, and personally by members of the Department of Ankylostomiasis, with the assistance of the official doctors. Literature has been issued and widely distributed: simple sheets for the general public, and pamphlets for the school-teachers and Government officials. Public meetings are held in every district where laboratories are established. In all of these districts the official doctor has given one or more lectures on hook-

TABLE 2: *Costa Rica—Dispensary Work: Number of Specimens Microscopically Examined and Found Positive, and Number of Persons Given First Treatment, During 1915, by Provinces and Cantons.*

PROVINCES AND CANTONS	Population	Specimens Examined	Specimens Positive	Persons Given First Treatment
Total.....	81,515	57,979	34,840	23,597
Provinces:				
Alajuela.....	12,133	10,954	7,539	5,833
Limon.....	11,483	4,814	2,013	1,554
Cartago.....	10,439	13,380	9,872	5,243
San Jose.....	17,534	21,505	9,930	7,122
Heredia.....	1,199	1,190	180	180
Puntarenas.....	23,307	5,082	4,536	2,978
Guanacaste.....	5,420	1,054	770	687
Alajuela:				
Atenas.....	8,884	7,767	5,238	4,035
Orotina.....	3,249	3,187	2,301	1,798
Limon:				
City of Limon.....	7,021	1,907	342	251
Pococi.....	4,462	2,907	1,671	1,303
Cartago:				
Paraiso.....	7,921	7,045	4,569	2,715
District of Tucurrique.....	1,191	1,993	1,604	1,001
District of Atirro.....	483	939	824	475
District of Tuis.....	844	3,403	2,875	1,052
San Jose:				
Puriscal.....	13,470	7,034	5,958	4,151
Central Office.....	.....	10,552	3,597	2,572
City Schools.....	4,064*	3,919	375	399
Heredia:				
City Schools.....	1,199*	1,190	180	180
Puntarenas:				
Puntarenas.....	18,040	3,001	2,531	1,944
Esparta.....	5,267	2,081	2,005	1,034
Guanacaste:				
Canas.....	5,420	1,054	770	687

* Figures represent school matriculation.

worm disease to the school-teachers, and in some instances to the public. With the hearty co-operation of the Minister of Public Instruction and the personnel of his department, a comprehensive booklet on hookworm disease was issued for the school-teachers, and where necessary this booklet was explained to the teachers by the official doctors. The teachers in turn during the last five months of the year gave a weekly lesson to their pupils on hookworm disease and personal hygiene. Whenever possible, special lectures are given to the officials of each district, members of the town board and school board, and prominent farmers, and talks to the people are given in their homes when the premises are inspected, and at the laboratories whenever ten or more persons form an audience.

Table 3 indicates that 8,032 lectures have been delivered in the work to date, at which the total attendance was 102,065 persons.

TABLE 3: *Costa Rica—Dispensary Work: Number of Lectures Delivered from September 23, 1914, to December 31, 1915, with Attendance.*

KIND OF LECTURES	Number	Attendance
Total	8,032	102,065
Public.....	100	12,069
School.....	355	12,220
Special.....	7,577	77,776

In the educational work by means of literature Table 4 indicates that 89,333 pieces of litera-

ture were distributed up to December 31, 1915, of which 56,172 were booklets and 21,119 were notices of dispensary dates.

TABLE 4: *Costa Rica—Dispensary Work: Number of Pieces of Literature Distributed from September 23, 1914, to December 31, 1915.*

CLASS OF LITERATURE	Number of Pieces Distributed
Total	89,333
Letters.....	3,248
Leaflets.....	7,186
Booklets.....	56,172
Notices.....	21,119
Unclassified.....	1,608

Sanitary Improvement

Recognizing that the success of the work depends upon the construction and use of sanitary latrines, every effort was made to have the preventive measures keep pace with those of treatment and cure. In Costa Rica this phase of the work is well fortified with a code of laws compelling the householders to effect such sanitary improvements as may be required by the Department of Ankylostomiasis. Even under the most favorable conditions, however, it is a slow and difficult task to change the confirmed habits of thousands of people and to bring them to a point where latrines will be built and used.

Immediately upon opening work in each district the assistants make an inspection of the latrine conditions at each home. A total of

8,261 homes have been inspected in the work to date. On the first inspection only 867, or 10.5 per cent of these homes, were found to be provided with latrines. During the progress of the work, usually at intervals of one month, subsequent inspections are carried out and improvement in sanitation noted. On the last inspection of the premises of these 8,261 homes, it was found that 2,123, or 25.7 per cent, had latrines—making an increase in the number of homes with latrines of 1,256, or 15.2 per cent. Table 5 presents figures showing the total results accomplished in sanitary improvement up to December 31, 1915.

TABLE 5: *Costa Rica—Dispensary Work: Sanitary Improvement from September 23, 1914, to December 31, 1915.*

	No.	P. C.
1. Homes Inspected.....	8,261	....
2. Homes With Latrines:		
(1) On First Inspection.....	867	10.5
(2) On Last Inspection.....	2,123	25.7
3. Homes Without Latrines:		
(1) On First Inspection.....	7,394	89.5
(2) On Last Inspection.....	6,138	74.3

GUATEMALA

In November, 1914, the Republic of Guatemala invited the International Health Commission to coöperate with it in measures for the relief and control of hookworm disease. The invitation was extended in a conference between the President of the country, His Excellency Sr. Lic. Manuel Estrada Cabrera, and Dr. J. H. White, who represented the Commission in the preliminary arrangements for work in Central America. On November 30, 1914, the invitation was formally accepted by the Commission. On that date Dr. W. H. Rowan was appointed Director. Dr. Rowan arrived in Guatemala on January 26, 1915, and following a series of conferences with Government officials, plantation owners, and influential citizens, began active work on March 15. Headquarters were established at Guatemala City and a staff of one field director, four microscopists, and one clerk was employed to assist the director.

The work in Guatemala is conducted as a branch of the National Board of Health, known as the Department of Uncinariasis. Dr. Rowan was appointed Director of this department, and three members of the National Board of Health were named a committee for directing its affairs. From the outset the National Board of Health has coöperated most energetically in the work.

Operations have been conducted on a plan

almost identical in its main features with the intensive method followed in the West Indies. House-to-house distribution and collection of specimen containers is carried out; treatment is administered in the homes of the patients; and simultaneously with the work of examination and treatment, measures for preventing reinfection are introduced. The main point of difference, however, is that microscopic re-examinations for determining cure are not a feature of the work, so that no definite figures are available for the number of persons remaining in each district uncured at the close of the work. For this reason the Guatemala work is classified throughout this report as being of the dispensary type.

The coffee plantation, or finca, is the unit of work. On the first day on an estate a dispensary is established. This serves as headquarters for examining specimens, keeping records, and preparing treatments. At night there is a public illustrated lecture. On the second day house-to-house visits are made and containers distributed. The work continues until all of the inhabitants have had an opportunity to be examined and treated. It has been found possible to complete work on estates of average size in about two weeks or eighteen days.

Up to December 31, 1915, work had been completed on eighty-seven coffee estates. All except eleven were located in what is known as

the Costa Cuba coffee district, lying between the rivers Naranjo and Tilapa, in the departments of Quezaltenango, Retalhulen, and San Marcos. This district is situated on the Pacific side of the country near the northern boundary with Mexico, and is located at an average altitude of 2,400 feet. The eleven estates not included in this district are located: one in the department of Santa Rosa, one in Chinaltenango, and nine in Suchitepequez. Almost the whole extent of the Costa Cuba district in which work has been conducted lies within the department of Quezaltenango, extending for short distances into the department of Retalhulen on the south and San Marcos on the north.

Some work was also undertaken in the town of Coatepeque in the department of Quezaltenango; the patients at the General Hospital of Guatemala were examined and treated; and a few examinations were made and treatments given at the central office.

Examination and Treatment

The work conducted up to December 31, 1915, embraced a population of 28,090 persons. Of these, 25,587, or 91.1 per cent, were microscopically examined, and 15,001, or 58.6 per cent of those examined, were found infected. First treatment was administered to 13,783 persons—91.9 per cent of those found infected. This is shown in Table 1.

TABLE 1: Guatemala—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from March 15, 1915, to December 31, 1915.

Districts	Census	NUMBER OF PERSONS			PERCENTAGE OF PERSONS		
		Microscopically Examined	Found Infected	Given First Treatment	Microscopically Examined	Found Infected	Given First Treatment
Total.....	28,090	25,587	15,001	13,783	91.1	58.6	91.9
Coffee Estates.....	25,544	24,163	14,482	13,419	94.6	59.9	92.7
Town of Coatepeque.....	1,500	378	242	102	25.2	64.0	42.1
General Hospital of Guatemala.....	818	818	264	249	100.0	32.3	94.3
Central Office.....	228	228	13	13	100.0	5.7	100.0

Considering separately the results accomplished on the coffee estates, to which the work may be said to have been practically confined, it will be seen that the work embraced a population of 25,544 persons, of whom 24,163, or 94.6 per cent, were microscopically examined. Of those examined, 14,482, or 59.9 per cent, were found infected, and 13,419, or 92.7 per cent of those infected, received first treatment.

Educational Work

Almost all of the inhabitants of the coffee estates are Indians. In some cases four or five tribes may be employed on one estate, each with its own dialect and customs. Members of one tribe frequently are incapable of conversing with the members of any of the other tribes. The absolute illiteracy of these people has made it necessary to depend upon individual instruction and to teach them so far as possible by means of pictures.

On the first evening following the opening of work on an estate a public lecture illustrated by stereopticon views is given. This lecture is always well attended and full of interest for the Indians, who have never before seen a stereopticon. The next day the assistant takes his chart and specimens and goes from house to house explaining the nature of the disease and the method of curing and preventing it. At the dispensaries demonstrations under the microscope

also are given. Table 2 indicates that 5,990 lectures, including house-to-house talks, have been given, at which the attendance was 46,300 persons. Eighteen were school lectures delivered to an audience of 300 persons, and 449 were public lectures attended by approximately 22,000 persons.

TABLE 2: *Guatemala—Dispensary Work: Number of Lectures Delivered from March 15, 1915, to December 31, 1915, with Attendance.*

	No.
Total Lectures	5,990
(a) Public.....	449
(b) School.....	18
(c) Special (house-to-house talks).....	5,523
Attendance at Lectures	46,300
(a) Public.....	22,000
(b) School.....	300
(c) Special (house-to-house talks).....	24,000

In addition, literature has been printed and distributed among persons able to read. Table 3 shows that a total of 7,124 pieces were distributed up to December 31, 1915.

TABLE 3: *Guatemala—Dispensary Work: Number of Pieces of Literature Distributed from March 15, 1915, to December 31, 1915, by Classes.*

	No.
Total Pieces of Literature Distributed	7,124
Pieces of Literature Distributed, By Classes:	
(1) Hookworm edition of daily paper.....	600
(2) Large bulletin on hookworm disease.....	1,824
(3) Small bulletin on hookworm disease.....	3,800
(4) Letters mailed.....	900

During the year the first public health bulletin ever issued in Guatemala was published jointly by the National Board of Health and the Department of Uncinariasis. In addition, three hundred large, one-page charts on hookworm disease, to be placed in schools throughout the Republic, have been completed, and a traveling exhibit has been prepared to teach the people in detail the story of the disease.

Sanitary Improvement

Due attention has been given to sanitary improvement. The necessity for this will be clear when it is stated that in work lasting over a period of almost an entire year, embracing eighty-seven estates and a population of 25,544 persons, only four latrines used by laborers and their families have been found. It might almost be said that in its small towns and rural districts Guatemala is a country without latrines. Besides, the conditions are particularly favorable for the spread of hookworm infection. On the coffee estates the coffee trees must be protected by a growth of larger shade trees; as a result the plantation becomes a forest jungle in which the ground is well shaded and is kept moist under a covering of mulch. The laborers live in small, detached houses scattered in rows over the estates. In the absence of latrine accommodations the soil about them becomes contaminated with hookworm eggs, and the whole laboring

population goes barefoot during the entire year.

Owners and officials of the estates upon which work is conducted appreciate the situation and are anxious to coöperate by having suitable latrines erected. One administrator to whom a plan was presented of a cheap but adequate latrine gave as his reason for rejecting it that he wished to erect forty of the best latrines in the country. This attitude is typical of the estate owners as a whole.

The latrines being erected in Guatemala are commonly placed at the end of a row of laborers' houses and are large enough to accommodate all of the persons living in that row. An average of about twelve persons is accommodated by each latrine. During the progress of the work 1,048 new latrines have been constructed under the supervision of the Department of Uncinariasis, to provide latrine accommodations for 12,576 persons, or approximately one-half of the total population of the estates. These figures represent only the actual number of new latrines erected while the work of examination and treatment was in progress on each estate. A great many more latrines are erected after the dispensary work has been completed, but figures for these are not available.

All latrine building is done at the expense of the estate owner. No work is conducted on the estate until the owners have agreed to carry out

the necessary measures of sanitary improvement. Table 4 presents a brief synopsis of the results accomplished to date.

TABLE 4: Guatemala—Dispensary Work: Sanitary Improvement from March 15, 1915, to December 31, 1915.

	No.
1. Latrines Found on Eighty-seven Coffee Estates, First Inspection.....	185
(a) At Mills (for officials and families).....	181
(b) At Homes of Laborers.....	4
2. New Latrines Erected for Laborers' Families..	1,048
3. Persons Accommodated by Each Latrine Erected for Laborers' Families.....	12
4. Persons Accommodated by New Latrines Erected for Laborers' Families.....	12,576

NICARAGUA

Formal invitation to the International Health Commission to participate in measures for the relief and control of hookworm disease was extended by the Republic of Nicaragua through its Legation at Washington on October 6, 1914. This invitation was accepted by the Commission on November 30, 1914, and on December 11, 1914, Dr. D. M. Molloy was appointed to have immediate charge of the work. Dr. Molloy assisted in organizing and conducting the work in Guatemala for some months, arriving in Nicaragua near the end of May, 1915. Headquarters were established at Managua. While awaiting receipt of equipment from the States, conferences were held with Government officials, physicians, and influential citizens, and attention was given to routine matters connected with the inauguration of work. To these preliminary activities the first four months were devoted.

By presidential decree issued in September, 1915, the work is conducted as a department of the National Board of Health, its official designation being the Department of Uncinariasis. In this way the work assumes official character, and is identified as a Nicaraguan effort, done by the Nicaraguan people under the patronage and with the support of their Government.

All the work of examination and treatment has been conducted on the dispensary plan. On

the San Antonio sugar plantation effort was made to accompany this work by the necessary sanitary reform, approaching in this respect more nearly the intensive plan of work. The staff has consisted of the director in charge, one clerk, one field director, termed medical assistant, and four microscopists, termed technical assistants. Wherever possible, house-to-house work has been attempted in securing specimens and administering treatment.

To date the work has been practically confined to the department of Chinandega, although some preliminary survey work was done during November and December, 1915, in the department of Managua.

Active work was begun on October 1, 1915, on the San Antonio plantation, the largest sugar plantation in Central America. This estate, embracing fifteen colonies, lies about four miles from the town of Chichigalpa in the department of Chinandega. Work was continued on this estate until November 1, when operations were begun in Corinto, a typical Nicaraguan town, located on the Pacific coast in the same department. Here work continued until December 1, when a permanent laboratory district for the department of Chinandega with headquarters in the town of Chinandega was established.

Most of the work in Nicaragua has been done in the more populous sections, where no racial

distinctions are attempted. Comparatively few people of foreign extraction have been examined, and no work has yet been done among the indigenous tribes. The majority of the persons examined belong to the mixed class.

Examination and Treatment

Up to December 31, 1915, 5,429 persons had been microscopically examined for hookworm disease, of whom 2,681, or 49.4 per cent, were found infected. First treatment was administered to 1,611, or 60.1 per cent of those infected. Table 1 gives figures by districts showing the results of examination and treatment.

TABLE 1: *Nicaragua—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from October 1, 1915, to December 31, 1915.*

DISTRICTS	NUMBER OF PERSONS			PERCENTAGE OF PERSONS	
	Microscopically Examined	Found Infected	Given First Treatment	Found Infected	Given First Treatment
Total.....	5,429	2,681	1,611	49.4	60.1
Department of Chinandega:					
San Antonio Estate.....	941	673	399	71.5	59.3
Corinto.....	1,172	940	592	80.2	63.0
Chinandega.....	976	480	362	49.2	75.4
Department of Managua:					
Managua.....	2,340	588	258	25.1	43.9

Educational Work

Educational work has been carried on in all districts where laboratories have been in operation. On beginning the work in each district, public lectures illustrated by lantern slides and charts have been delivered. Local officials, plantation owners, priests, teachers, and leading citizens have also been interviewed and their support enlisted. About 1,500 pamphlets, treating of the disease in general, and a great many posters announcing the opening of the work, have been distributed.

Sanitary Improvement

There are no definite regulations covering the construction and use of sanitary latrines. Efforts at sanitary reform have therefore centered in advice given to the people at the lectures and at the dispensaries to build latrines for their own protection. On the San Antonio sugar estate during November about twenty pit latrines were installed. This measures the practical results so far accomplished. The President, however, has manifested his desire to coöperate by instructing the governors of departments and local officials to issue regulations compelling the construction and proper maintenance of latrines. Dr. Molloy has been asked to aid in framing a bill to be submitted to Congress in which sanitary regulations adequate for the present requirements of the country may be formulated. It is therefore hoped that an effective campaign may be inaugurated

during the coming year. To this end the Minister of Public Instruction has promised to coöperate through the schools by having the children properly instructed in sanitary requirements at their homes, and by setting them an object lesson in sanitation at the schools.

The sanitary survey of 469 homes in the town of Corinto, exhibited in Table 2, may be taken as typical of conditions in the average town of Nicaragua. It will be seen that only 185, or 49.1 per cent of the homes, had latrines of any kind, and that 142 of these, or 76.8 per cent, were provided with latrines of the open-back type entirely inadequate for preventing pollution of the soil. It may therefore be said that only 43, or 23.4 per cent of the homes, were provided with conditions of sewage disposal adequate for preventing hookworm disease.

TABLE 2: *Nicaragua—Dispensary Work: Survey of Premises in the Town of Corinto, November, 1915.*

	TOWN OF CORINTO	
	No.	P. C.
1. Homes Inspected	377	....
2. Homes With Latrines.....	185	49.1
3. Homes Without Latrines	192	50.9
4. Types of Latrines Found:		
(1) Sewerage.....	9	4.9
(2) Septic tank.....	9	4.9
(3) Pit latrine, fly-proof.....	20	10.8
(4) Pit latrine, unprotected from flies; or fly-proof, surface latrine.....	5	2.7
(5) Open-back, surface latrine.....	142	76.8

PANAMA

The first annual report spoke of the inauguration of work in Panama, described briefly the methods followed in the preliminary operations, and gave an account of the results up to December 31, 1914. The work received the formal sanction and authority of the Government when, on September 2, 1915, an executive decree was signed by the President incorporating it as a part of the Department of Public Works with the title of Department of Uncinariasis. During 1915 the work continued under the direction of Dr. L. W. Hackett.

Operations in Panama follow the dispensary plan, but whenever practicable treatments are followed up and re-examinations made for determining cure. In this country the sparseness of the population, the difficulties of travel and communication, and the absence of large towns or estates giving employment to hundreds of people seem to make the dispensary method a better way of bringing relief to the sufferers. The staff engaged in the work, in addition to the Director and his clerk, consists of four field directors, termed technical assistants, and eight microscopists. Four laboratories are in operation, three in the field and one at the central office. The three field laboratories succeed in examining about 95 per cent of the accessible population in each district. Approximately

one-half of the persons found infected receive at least two treatments, which, as shown elsewhere in this report, are adequate for curing the disease in about 50 per cent of the cases.

Up to December 31, 1915, work had been conducted in fifteen districts in seven provinces of Panama. The districts in which work has been undertaken contain 30 per cent of the total area of the country and 35 per cent of the total population. It should be understood, however, that in many of these districts work had not been completed by December 31, 1915; only in the province of Bocas del Toro, embracing the districts of Almirante, Bastimentos, Bocas del Toro, and Chiriqui Grande, may the work be said to have been completed. In all of the districts, and especially on the Pacific side of the country, great stretches of uninhabited hill and forest intervene and there is considerable territory inhabited by scattered Indian tribes, so that every square mile is not covered.

Examination and Treatment

A total of 30,331 persons have been microscopically examined—5,321 during 1914, and 25,010 during 1915. Of these, 19,797, or 65.3 per cent, were found infected, and 17,480, or 88.3 per cent of those found infected, were given first treatment.

Table I shows the total number of persons

examined and treated in the work to date, and compares the results for 1914 and 1915.

TABLE 1 : *Panama—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from July 15, 1914, to December 31, 1915.*
With Comparison of Results During 1915 and During 1914.

	UP TO DECEMBER 31, 1915		DURING 1915		DURING 1914	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	30,331	....	25,010	....	5,321	....
2. Found Infected.	19,797	65.3	16,890	67.5	2,907	54.6
3. Given First Treatment...	17,480	88.3	14,918	88.3	2,562	88.1

In Table 2 detailed figures are given for each district where work has been conducted during 1915. The figures in this table should be added to those given in the first annual report to obtain the total figures for each district to date. (See Table 2, page 185.)

Both in percentage and degree of infection, the native population along the Atlantic Ocean and in the foothills of the mountains on the Pacific side, where the dry season is not well defined and the people are engaged mainly in agriculture, has been found to suffer most. The percentage of infection ranges from 85 to 95 per cent, and the hemoglobin index is below 60. The people of the plains on the Pacific side, where there is no moisture for three months in the year, have in comparison with this a per-

TABLE 2: *Panama—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment During 1915, by Provinces and Districts.*

PROVINCES AND DISTRICTS	NUMBER OF PERSONS		
	Microscopically Examined	Found Infected	Given First Treatment
Total.....	25,010	16,890	14,918
Provinces:			
Panama.....	6,793	4,188	3,963
Bocas del Toro.....	5,879	3,240	3,024
Colon.....	1,379	1,144	966
Cocle.....	7,797	5,879	4,924
Herrera.....	3,162	2,439	2,041
Panama:			
Arraijan.....	48	24	19
Capira.....	30	24	25
Chame.....	1,943	1,420	1,326
Panama.....	2,109	920	881
San Carlos.....	1,671	1,262	1,196
Taboga.....	992	538	516
Bocas del Toro:			
Almirante.....	4,655	2,441	2,286
Bastimentos.....	518	298	278
Bocas del Toro.....	94	31	36
Chiriqui Grande.....	612	470	424
Colon:			
Chagres.....	798	627	586
Donoso.....	581	517	380
Cocle:			
La Pintada.....	3,743	3,070	2,338
Penonome.....	4,054	2,809	2,586
Herrera:			
Chitre.....	3,162	2,439	2,041

centage of infection not above 65 and an average hemoglobin of more than 70.

Educational Work

In each district where laboratories are located, the staff lectures on the cause and the effect of the disease, and the methods of relieving and controlling it. Instruction is given by addresses delivered to schools, to the general public, and by house-to-house or individual talks. Table 3 shows that up to December 31, 1915, 5,193 lectures were delivered, attended by 22,635 persons. Forty-nine were school lectures and 117 public.

TABLE 3: *Panama—Dispensary Work: Number of Lectures Delivered from July 15, 1914, to December 31, 1915, with Attendance.*

	Number
Total Lectures	5,193
(a) School	49
(b) Public	117
(c) House-to-house	5,027
Attendance at Lectures	22,635
(a) School	3,104
(b) Public	3,311
(c) House-to-house	16,220

Literature is also distributed extensively by the staff in the field and at the central office. Table 4 shows that up to December 31, 1915, 9,585 pieces of literature were distributed, 8,270 of which were leaflets telling in detail the story of the disease.

TABLE 4: *Panama—Dispensary Work: Number of Pieces of Literature Distributed from July 15, 1914, to December 31, 1915, by Classes.*

	Number
Pieces of Literature Distributed	9,585
(a) Letters.....	320
(b) Posters.....	824
(c) Booklets.....	171
(d) Leaflets.....	8,270

Sanitary Improvement

Elementary sanitation is one of the greatest needs of Panama. In some loosely built towns of approximately 4,000 inhabitants there are few latrines of any description. Where latrines exist they are of such a character as to be a menace rather than a protection. It seems probable that these conditions will be improved during the coming year by the enactment of a law requiring that all houses shall be provided with latrines, which shall be regularly inspected. Up to this time efforts at sanitary reform have had to rely wholly upon education and persuasion, which, unbacked by legislation, have been found to accomplish very little. One important advance, however, has been made by the Department of Public Instruction in equipping schoolhouses in the interior with latrines. It is estimated that about one-half of the schools now have latrines which were built during the year 1915. The work of constructing these latrines will be continued until every schoolhouse in the country has been provided.

EGYPT

Measures against hookworm disease in Egypt are under the direct supervision of Dr. A. MacCallan, of the Government Department of Public Health. The work has been conducted in accordance with a plan formulated by the local uncinariasis committee. It has two main features: (1) hospital work; and (2) survey work. Conditions in Egypt seem to make it necessary to administer treatment to infected persons under hospital conditions. For this purpose traveling tent hospitals, each capable of accommodating 100 patients, are established at convenient points, to which the people come for free examination and treatment. Infected persons are housed and fed at the hospital until the full course of treatment has been completed. Many of them come for hundreds of miles to receive the benefit of treatment, some floating down the Nile on rafts from remote sections of Upper Egypt. Among 10,860 persons treated up to March 31, 1915, 3,067, or 28.2 per cent, came from provinces other than those in which the hospitals were established. At each of these traveling hospitals a laboratory is provided for the microscopic examination of feces, urine, and blood; and a small separate enclosure is reserved for women patients. Each has its own staff, consisting usually of two doctors, a clerk, two male and one female attendants, a cook, a gate-

keeper, a water-carrier, a watchman, and a messenger-boy.

The scheme provides also for a systematic survey to determine the prevalence of hook-worm disease, as well as to establish the danger points about the villages from which the infection is spread. In the survey work clinical examinations are also made incidentally for estimating the degree of prevalence of two other endemic scourges: bilharziasis and pellagra.

Hospital Work

The original scheme of operations provided that hospital work should be undertaken province by province until the whole of the infected area had been covered. On this basis it was proposed to establish from four to six traveling hospitals at convenient points, and to move these hospitals from point to point as the applications for admission diminished. The outbreak of the European war, by curtailing the revenue of the Egyptian Government, resulted in the enforced reduction of the number of traveling hospitals to two.

Initial operations were begun in Qaliubia province on December 13, 1913, when a traveling hospital was opened at Qaliub. Subsequently, on March 1, 1914, a second hospital was established at Qalama. Both of these hospitals remained in operation until August 10, 1914, when they were removed and established

on September 5, 1914, at Belbeis and Minia el Qamh in Sharqia province. These two hospitals continued in operation until April 8, 1915, when operations against hookworm disease had to be temporarily abandoned and the hospitals moved to Alexandria to provide emergency accommodations for wounded soldiers. During all of this period the permanent hospital on the estate of Ibrahim Pasha Murad at El Deir was also used for the accommodation and treatment of persons suffering from hookworm disease.

The number of persons microscopically examined for hookworm disease in the hospital work conducted from December 13, 1913, to April 8, 1915, when work had to be temporarily abandoned, was 20,865. Of these, 12,450, or 59.7 per cent, were found to be infected. Of those infected, 11,280, or 90.6 per cent, were admitted to the hospitals; and 10,694, or 94.8 per cent of those admitted, completed the full treatment. These figures are exhibited in Table 1.

TABLE 1: *Egypt—Hospital Work: Number of Persons Examined, Found Infected, Admitted to Hospitals, and Given Full Treatment from December 13, 1913, to April 8, 1915.*

	No.	P. C.
1. Persons Microscopically Examined.....	20,865	....
2. Persons Found Infected.....	12,450	59.7
3. Persons Admitted to Hospitals.....	11,280	90.6
4. Persons Given Full Treatment for Uncinari- nariasis.....	10,694	94.8

Patients who completed the full treatment were encouraged to return to the hospital for re-examination one month or more after being discharged, and were promised a bottle of iron medicine as an incentive. In each case the feces were centrifuged and two slides carefully examined before the specimen was pronounced negative. Statistics show that up to April 8, 1915, the number of persons who were thus re-examined following treatment was 1,859, or 17.4 per cent of those who received full treatment, and it was found that 1,622, or 87.3 per cent of the persons re-examined, had been cured. Table 2 exhibits this information in tabular form.

TABLE 2: *Egypt—Hospital Work: Number of Persons Given Full Treatment, Re-examined After Full Treatment, and Found Cured Upon Re-examination, from December 13, 1913, to April 8, 1915.*

	No.	P. C.
1. Persons Given Full Treatment.....	10,694	....
2. Persons Microscopically Re-examined One Month or More After Receiving Full Treatment.....	1,859	17.4
3. Persons Found Cured Upon Microscopic Re-examination.....	1,622	87.3

Survey Work

Simultaneously with the hospital work, surveys have been conducted in the province of Sharqia in Lower Egypt and Assiut in Upper Egypt for determining the degree of infection and for locating the danger points from which

the infection is spread. Clinical examinations have also been made for pellagra and bilharziasis.

The survey in Sharqia province was conducted during the months of October, November, and December, 1914, and its results were reported in detail in the first annual report. The survey in Assiut was in progress from January to April, 1915. During April the survey work terminated along with the hospital work, when all facilities for the care of sick and wounded soldiers were requisitioned for use at Alexandria.

In both provinces the survey was confined to men and boys, owing to the difficulty of examining women in Oriental countries; there is, however, no doubt that women are largely infected. In Sharqia province, among 6,082 males examined, representing approximately 0.7 per cent of the total population, 3,412, or 56.1 per cent, were found infected. In Assiut, 4,411 males were examined—0.5 per cent of the total population—and 2,018, or 45.7 per cent, were found infected. This information in detail is shown in Table 3. (See Table 3, page 193.)

The prevalence of hookworm disease in Sharqia, a typical province of Lower Egypt, to the extent of 56 per cent, and in Assiut, a typical province of Upper Egypt, to the extent of 45 per cent, seems to justify the conclusion that the disease is wide-spread throughout Egypt.

In the province of Assiut the infection among men, all of whom resided in the seven largest

TABLE 3: *Egypt—Survey Work: Comparison of Number of Persons Examined and Found Infected in Sharqia and in Assiut Provinces.*

PROVINCES	Population	Number Examined	Per Cent Examined	Number Infected	Per Cent Infected
Total.....	1,776,584	10,493	.6	5,430	51.7
Sharqia.....	900,000	6,082	.7	3,412	56.1
Assiut.....	876,584	4,411	.5	2,018	45.7

towns of the province, was found to be 27.5 per cent, as compared with an infection of 22.7 per cent among the boys examined in these same towns. The difference between boys and men is thus seen to be small, so that the survey of rural districts, which was based entirely upon the examination of boys, may be taken as a fairly accurate measure of the infection among adults.

A very considerable difference was found to exist between the infection in the large towns and in the country villages. In the large towns the percentage of boys infected was 22.7 per cent, while in the villages it was 51.1 per cent. In the capital town of the province, Assiut, only 4.4 per cent of the boys were infected.

A cursory examination for pellagra was conducted among the 4,411 persons examined for hookworm disease, and it was found that 89, or 2.0 per cent, were infected with this disease. It

should be pointed out, however, that the survey was conducted during the winter months, when pellagra is not common, and also that the disease was not diagnosed unless very obvious.

For the purpose of estimating the prevalence of bilharziasis, each of these 4,411 persons was also questioned as to whether or not he had ever noticed blood in his urine. Those stating that they had done so numbered 443 persons—10.0 per cent of the total. These were classed as infected with bilharziasis. This is probably quite a legitimate conclusion; but the converse, that those who had not noticed blood in their urine were not infected, is far from being correct.

Hemoglobin tests were made of the blood of 505 boys, 138 of whom were infected with hookworm disease and 367 were not. The hemoglobin index of the non-infected boys was 75.5, as compared with the index of 69.6 among the infected.

In every town or village a note was made as to the presence or absence of pools of stagnant water, termed birkets. These birkets contain infiltration water which at certain seasons of the year may dry up. To them are attributed much of the high incidence of disease and consequent mortality, especially among children. In the case of hookworm disease, however, it was found that those villages with birkets did not show a markedly heavier infection than the villages without them.

III. SUMMARY OF INCIDENTAL ACTIVITIES

I

HEMOGLOBIN TESTS

1. **Among General Population.**—In three countries—Costa Rica, Panama, and Egypt—hemoglobin tests were made of a large proportion of the persons who were examined for uncinariasis. The blood of 41,380 persons was tested and it was found that the average hemoglobin index of these persons was 59. In Panama and Costa Rica the index was 63 and 64 respectively, while in Egypt it dropped to 44. These statistics are exhibited in Table 1 :

TABLE 1: *Hemoglobin Tests—Costa Rica, Panama, and Egypt: Comparison of Hemoglobin Index.*

COUNTRY	Hemoglobin Index	Number of Hemoglobin Tests Made
Total.....	59	41,380
Costa Rica.....	64	19,494
Panama.....	63	12,190
Egypt.....	44	9,696

2. **Comparison of Infected and Non-Infected Cases.**—Uncinariasis is not the only factor contributing to this anemia. In all of these countries insufficient nourishment and the presence of other diseases play their part in

reducing the vitality of the inhabitants. But that uncinariasis is responsible for much of this anemia is shown by tests made in Costa Rica, Grenada, and Egypt, the results of which are presented in Tables 2, 3, and 4.

In Costa Rica (see Table 2) hemoglobin tests made of the blood of 7,355 infected persons taken at random gave an index of 66, as compared with an index of 71 among 4,860 persons taken at random who were not infected. Further tests were made of the blood of 1,150 persons who had been cured of uncinariasis and it was found that the hemoglobin index of these persons immediately following treatment had risen to 75, showing that as a result of treatment and cure for uncinariasis the hemoglobin index rose to a point four degrees higher than the index of persons who were not originally infected.

TABLE 2: *Hemoglobin Tests—Costa Rica: Comparison of Index of Persons Infected, Not Infected, and Cured.*

	Hemoglobin Index	Number of Hemoglobin Tests Made
1. Persons Infected with Uncinariasis.....	66	7,355
2. Persons Not Infected with Uncinariasis.....	71	4,860
3. Persons Cured of Infection with Uncinariasis.....	75	1,150

In Grenada (see Table 3) comparison of the hemoglobin index of 429 persons infected with uncinariasis with the index of 135 persons not

infected with uncinariasis showed that for the first group the index was 78 as compared with 85 for the second—a difference of seven points in the group average of persons infected and not infected. This is shown in Table 3.

TABLE 3: *Hemoglobin Tests—Grenada: Comparison of Index of Persons Infected and Not Infected.*

	Hemoglobin Index	Number of Hemoglobin Tests Made
1. Persons Infected with Uncinariasis.....	78	429
2. Persons Not Infected with Uncinariasis.....	85	135

3. Comparison of Infected Cases Before and After Treatment.—In Egypt (see Table 4) a record was kept of the hemoglobin index of infected persons before and after treatment. Among 9,696 infected persons the hemoglobin index on admission to hospital was found to be 44. Opportunity was had for re-examining 4,031

TABLE 4: *Hemoglobin Tests—Egypt: Comparison of Index of Persons on Admission to Hospital with Index of Same Persons Following Treatment.*

	Hemoglobin Index	Number of Hemoglobin Tests Made
1. Persons Infected with Uncinariasis: On Admission to Hospital.....	44	9,696
2. Persons Cured of Uncinariasis: One Month or More After Being Fully Treated and Discharged From the Hospital...	49	4,031

of these persons a month or more after they had been fully treated for uncinariasis and discharged from the hospital, and it was found that the hemoglobin index for the group had risen to 49. (See Table 4, page 197.)

4. **By Races.**—For the countries of Panama and Costa Rica an interesting comparison of the hemoglobin index by races is given in Table 5. These blood tests were made of the general population at the time when the specimens of feces were submitted for examination, and include persons infected and not infected. The table indicates that for these two countries the hemoglobin index, both for all of the races taken together and for each race taken separately, bears a remarkable similarity. For Costa Rica

TABLE 5: Hemoglobin Tests—Costa Rica and Panama:
Comparison of Hemoglobin Index by Races.

RACES	HEMOGLOBIN INDEX		NUMBER OF HEMOGLOBIN TESTS MADE	
	Costa Rica	Panama	Costa Rica	Panama
All Races.....	64	63	19,494	11,270
White.....	65	62	5,331	360
Brown.....	65	64	11,083	2,857
Black.....	71	65	579	3,605
Indian.....	..	58	.....	1,949
Yellow.....	..	70	.....	31
Not Classified....	58	59	2,501	2,468

the index for all races combined is shown to be 64, as compared with 63 for Panama. The Indian race in Panama presents the lowest index, with 58; and the black race in Costa Rica the highest, with 71. (See Table 5, page 198.)

II

TREATMENT FOR PARASITIC DISEASES OTHER THAN UNCINARIASIS

In all countries where uncinariasis exists the disease is complicated by the presence of other intestinal parasitic diseases, including infection with round worms (*Ascaris*), whip worms (*Trichocephalus*), pin worms (*Oxyuris*), tape worms (*Tænia*), and various other species of parasitic worms. For instance, among 291,855 persons examined for uncinariasis in the Southern United States, British West Indies, Central America, and Egypt, 98,454 were found to be infected with *Ascaris*, 68,590 with *Trichocephalus*, 3,921 with *Strongyloides*, 2,764 with *Tænia*, and 4,743 with *Oxyuris*. Often two, three, or more of these parasites exist in the same person; in Costa Rica more than ninety per cent of the population so far examined have been found to harbor one or more species of intestinal parasites. No thorough examination for parasites other than *Uncinaria* is carried out; the eggs of the other worms are always revealed incidentally in the search for *Uncinaria*, and no

further examination of the specimen is made after the ova of *Uncinaria* have been discovered.

In most of the countries no attempt has been made to administer treatment for other parasites, the work of relief being confined to measures against uncinariasis alone. In a few, however, as in Trinidad, Costa Rica, Guatemala, Nicaragua, and Panama, it has been found that treatment for other parasites often lends strong psychic support to the measures against uncinariasis. This is notably true in the case of *Ascaris*. These are large worms plainly visible to the naked eye, and when expelled by the patient after treatment they enable him to understand

TABLE 6: *Trinidad, Costa Rica, Guatemala, Nicaragua, and Panama: Number of Treatments Administered for Parasitic Diseases Other than Uncinariasis.*

COUNTRY	TREATMENTS ADMINISTERED FOR PARASITIC DISEASES OTHER THAN UNCINARIASIS				
	Total	Ascaris	Tenia	Amoeba	Not Classified
Total.....	20,744	3,584	2	4	17,154
Trinidad.....	1,108	1,107	1	..	.....
Costa Rica.....	2,153	.....	..	..	2,153
Guatemala.....	15,001	.....	..	..	15,001
Nicaragua.....	1,263	1,260	..	3	.....
Panama.....	1,219	1,217	1	1	.....

better the part that the smaller worms, such as *Uncinaria*, may play in undermining his health.

Table 6 shows that 20,744 treatments were administered for other diseases in the five countries above named. In Guatemala and Costa Rica the number of treatments administered for each of the parasites is not given, but in both countries most of the treatments were for *Ascaris*. In Costa Rica, however, a large number of school-children in the cities of San José and Heredia were treated for *Tænia*, and in Panama forty-five persons received treatment for malaria in addition to the regular work against uncinariasis. (See Table 6, page 200.)

IV. TECHNIQUE OF EXAMINATION AND TREATMENT

I

MICROSCOPIC EXAMINATION

In Trinidad and British Guiana during 1915 experiments were conducted for determining the importance of the centrifuge as an aid in correct diagnosis. These experiments show a striking similarity in results and go far toward establishing a correct technique of microscopic examination. By a method combining the examination of a number of ordinary smeared slides with the examination of a number of smeared slides after the specimen had been centrifuged, an improvement was obtained of approximately 11 per cent over the results by the ordinary smeared-slide process. This is exhibited in Table 1. (See Table 1, page 203.)

In Trinidad the test led to the adoption of the examination of two smeared slides before centrifuging and two smeared slides after centrifuging as the routine method of diagnosis. In examining the 1,434 specimens referred to in Table 1, a record was kept of the results obtained on each slide. These results are exhibited in Table 2. (See Table 2, page 204.)

TABLE 1: *Trinidad and British Guiana—Intensive Work: Comparison of Results of Microscopic Examination with and without Use of Centrifuge.*

COUNTRY	SMEARED SLIDE METHOD: WITHOUT USE OF CENTRIFUGE			COMBINED METHOD: SMEARED SLIDES AND CENTRIFUGED SMEARED SLIDES			DIFFERENCE IN FAVOR OF COM- BINED METHOD WITH USE OF CENTRIFUGE	
	Specimens Examined	Specimens Positive	Percentage Positive	Specimens Examined	Specimens Positive	Percentage Positive	Specimens Positive	Percentage Positive
Total.....	2,134	1,049	49.2	2,134	1,277	59.8	228	10.6
Trinidad.....	1,434	741	51.7	1,434	895	62.4	154	10.7
British Guiana.....	700	308	44.0	700	382	54.6	74	10.6

TABLE 2 : *Trinidad—Intensive Work: Detailed Results of Examination of Each Slide Before and After Using Centrifuge.*

	No.	P. C.
Specimens Examined	1,434	....
Specimens Positive	895	62.4
Positive Without Centrifuge	741	82.8
Positive With Centrifuge	154	17.3
Positive on First Smear Slide Before Centrifuging	609	68.0
Positive on Second Smear Slide Before Centrifuging	132	14.7
Positive on First Smear Slide After Centrifuging	109	12.2
Positive on Second Smear Slide After Centrifuging	45	5.0
Positive on Third Smear Slide After Centrifuging	00	....

From the fact that no ova were discovered on the third slide examined after centrifuging, Dr. Washburn concluded that an examination of two slides after the specimen had been centrifuged was sufficient for accurate diagnosis.

In British Guiana the results obtained on each slide have not been reported, but for the first examination of each person Dr. Field has been led to adopt the routine of examining from five to eight smeared slides before centrifuging, and five smeared slides after centrifuging. For re-examination after treatment this process is reversed and from five to eight centrifuged smeared slides are examined first. Whether the results obtained are sufficient to justify the

examination of so many slides from each specimen can be determined only on the basis of further investigation: in both countries, however, the routine of examination would seem to be thorough enough for locating practically all of the infected cases.

In Trinidad the following rules have been adopted for the examination of specimens:

1. Each microscopist must examine in every detail and one at a time the specimens which are assigned to him. He will make a smear of the specimen on a glass slide with a wooden toothpick for examination with the microscope, using a different toothpick for each specimen and for each smear. The microscopist must make his own smears, prepare his own negative specimens for the centrifuge, and make out his own reports.

2. Two large smears will be made from each specimen and carefully examined in the ordinary way. If the specimen is found to be negative on being examined in this way, it will be put aside and centrifuged.

3. When a microscopist has accumulated twenty negative specimens he will prepare them for the centrifuge as follows:

- (a) Containers will be placed on a chart having small squares numbered from one to twenty, and will be taken up one by one, beginning at number one.

- (b) A sufficient portion of the specimen will be placed in a small glass jar to which water has been added, and an emulsion made by stirring with a toothpick.

- (c) The emulsion will then be poured through a funnel into a centrifuge tube, one end of which has been previously corked.

- (d) A cork will then be placed in the other end of the tube, and the tube placed in the pan of the centrifuge at the number corresponding to the

number on the chart from which the specimen was taken.

(e) After twenty specimens have been prepared and centrifuged, smears will be made from the outward end of each tube and examined. Two smears must be examined before the specimen is pronounced negative.

The microscopic department is equipped with microscopes having mechanical stages, centrifuge glassware, microscopic slides (size 1 x 3 inches preferred), toothpicks, and paper bags. Mechanical stages for the microscopes have been found to be almost indispensable for thorough and efficient work. The centrifuge used in the work is a specially constructed machine placed upon the market by the Bausch & Lomb Optical Company. It is a hand-driven machine equipped with a Stewart pan-head carrying twenty tubes.

After the specimens have been examined, the discarded tins and dirty toothpicks are thrown into paper bags. These bags are emptied each day into a large barrel filled with water into which crude carbolic acid has been placed as a deodorant. Kerosene oil is placed on top of the water to keep mosquitoes away. When the barrel becomes filled, it is carted off to the public dumping ground and the contents buried. The dirty glassware—microscopic slides, centrifuge tubes, and funnels—is placed into a pan containing a solution of formalin. After each day's work this solution is poured off and the glassware

is washed in clean water and then boiled. After being boiled it is left over night in a solution of methylated spirits (denatured alcohol) and the next morning dried with a clean towel.

In British Guiana a series of experiments was carried out for determining whether or not the thorough examination of one specimen following treatment is sufficient for demonstrating cure, and if so, at what interval of time following the last treatment this specimen should be secured. Some authorities have held that two treatments are incapable of producing a cure in all but a few mild cases, despite the fact that the records in many of the countries indicate that cures are produced by two treatments in approximately fifty per cent of the cases. Others have held that the re-examination of one specimen is insufficient for determining whether any given case is positive or negative; that re-examination at the end of one week, or less than one week, following the administration of thymol does not allow sufficient time for the ova to reach the rectum; and that the administration of thymol interferes with the procreative functions of the *Uncinaria* remaining in the intestine, so that more than one week must be allowed for these functions to be completely restored. These considerations led Dr. Field to re-examine at an interval of one month after treatment, 117 cases which had received only two treatments and which had been pronounced cured following

microscopic examination of one specimen. In originally pronouncing these cases cured, the regular technique of re-examination in British Guiana was followed, consisting of the examination of from five to eight smeared slides from a centrifuged emulsion, followed by the examination of five more smeared slides from the original specimen without centrifuging.

Ninety-nine of the 117 cases re-examined one month after being pronounced cured were cases which had not originally been re-examined and pronounced cured until a lapse of at least seven days following treatment. These cases ran from a minimum of seven days to a maximum of forty-eight days (mean, eleven days) following treatment before the specimen was re-examined upon which the cure was pronounced. Among these 99 cases re-examined one month after they had been pronounced cured, only six positive cases, or 6.1 per cent, could be detected; and to detect ova in these cases microscopic examination had to be made of from three to eight smeared slides from centrifuged specimens. Thirty-seven of these 99 cases had not been pronounced cured until at least nine days had elapsed following treatment; among these, only one specimen, or 2.6 per cent, contained ova.

The other eighteen of the 117 cases re-examined at the end of one month after being pronounced cured were cases that had been declared negative on re-examination less than

seven days after treatment. Among these 18 cases two were found positive, or a percentage of 11.1, as compared with the percentage of 6.1 among the cases in which a lapse of at least seven days had been allowed. These figures, though not extensive enough to be conclusive, seem to indicate that in almost all cases, especially when at least nine days are allowed to elapse after treatment before re-examination is undertaken, the thorough examination of one specimen is sufficient for determining whether or not the patient has been cured. Of the few persons who were found positive one month after being pronounced cured on re-examinations made after a lapse of at least nine days (in the case of British Guiana 2.6 per cent of the cases re-examined), it may be that a large proportion were persons who had in their bodies at the time of re-examination a few parasites en route to the intestines.

II

TREATMENT

One treatment for uncinariasis is seldom sufficient to effect a cure. Treatment must be repeated according to the severity of the infection and the efficacy of the drug used. It has been found that two treatments usually cure about 50 per cent of the infected persons. The persons not usually cured by two treatments are those in whom the infection is of long standing and the

worms are so firmly buried that the anthelmintic has little effect upon them, or persons in whom the infection is very heavy and there are large numbers of worms to be expelled. Table 3 shows that among 13,166 persons cured in the countries of British Guiana, Dutch Guiana, St. Vincent, and Trinidad, 5,772, or 43.8 per cent, were cured by two treatments.

TABLE 3: *Intensive Work—Total Number of Persons Cured, with Comparison of Number Cured by Two Treatments.*

COUNTRY	PERSONS CURED	PERSONS CURED BY TWO TREATMENTS	
	No.	No.	P. C.
Total.....	13,166	5,772	43.8
British Guiana.....	8,612	3,678	42.7
Dutch Guiana.....	492	391	79.5
St. Vincent.....	1,350	457	33.9
Trinidad.....	2,712	1,246	45.9

The number of persons cured following each successive treatment has also been reported for these countries and is summarized in Table 4. This shows that of the 13,166 persons cured, only 2,175, or 16.5 per cent, required more than four treatments. (See Table 4, page 211.)

The total number of treatments administered in the dispensary work conducted during 1915 is shown in Table 5. (See Table 5, page 212.)

In most of the countries thymol is the drug regularly used. This is usually administered in capsules, preceded and followed by a dose of

TABLE 4: *Intensive Work—Number of Persons Cured Following Each Treatment.*

	TOTAL		BRITISH GUIANA		DUTCH GUIANA		ST. VINCENT		TRINIDAD	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
Persons Found Infected.	18,835	....	11,217 ¹	....	1,942	....	1,676	....	4,000	....
Persons Cured.....	13,166	69.9	8,612 ¹	76.8	492	25.3	1,350	80.5	2,712	67.8
Persons Cured After Each Treatment:										
First and Second.....	5,772	43.8	3,678	42.7	391	79.5	457	33.9	1,246	45.9
Third.....	2,944	22.4	2,455	28.5	101	20.5	301	22.3	87	3.2
Fourth.....	2,275	17.3	1,353	15.7	....	....	262	19.4	660	24.3
Fifth.....	1,139	8.7	648	7.5	....	....	155	11.5	336	12.4
Sixth.....	557	4.2	281	3.3	....	....	95	7.0	181	6.7
Seventh.....	248	1.9	107	1.2	....	....	46	3.4	95	3.5
Eighth.....	118	.9	49	.6	....	....	15	1.1	54	2.0
Ninth.....	64	.5	24	.3	....	....	9	.7	31	1.1
Tenth.....	30	.2	13	.2	....	....	6	.4	11	.4
Eleventh.....	14	.1	3	....	....	....	4	.3	7	.3
Twelfth.....	2	....	....	....	....	....	....	....	2	.1
Thirteenth.....	3	....	1	....	....	....	....	....	2	.1

¹ The figures given in this table for the number of persons found infected and cured in British Guiana do not agree with the figures given in previous tables. In this table the number of persons found infected and cured in Area B of the Peter's Hall district in British Guiana are excluded. In that area treatment was administered by the daily method, whereas in the other areas of British Guiana and in all of the areas in the other countries the weekly method was employed.

TABLE 5: *Dispensary Work—Total Number of Treatments Administered, with Comparison of First, Second, Third, and Fourth Treatments.*

STATES AND COUNTRIES	Total Number of Treatments Given	NUMBER OF PERSONS RECEIVING EACH TREATMENT			
		First	Second	Third	Fourth
Total	224,414	110,219	68,632	28,966	8,719
Southern United States.....	74,784	37,051	19,548	15,446	7,659
West Indies.....	46,763	15,918	10,781	7,279	5,161
Central America.....	102,867	57,250	38,303	6,241	899
Southern United States:					
Alabama.....	1,742	1,499	237	6	.....
Georgia.....	52,680	21,585	15,662	12,700	2,653
Kentucky.....	5,841	5,814	27	.....	.....
Tennessee.....	8,491	3,069	2,739	2,683	.....
Texas.....	6,030	5,084	883	57	6
West Indies:					
Grenada.....	37,807	11,522	8,064	6,285	4,645
Trinidad.....	8,956	4,396	2,717	994	516
Central America:					
Costa Rica.....	47,739	26,938	15,330	4,457	844
Guatemala.....	26,417	13,783	11,851	783	.....
Nicaragua.....	1,918	1,611	293	14	.....
Panama.....	26,793	14,918	10,829	987	55
					4
					7,878
					80
					7,624
					174

Epsom salts. The object of the Epsom salts is to free the intestine from mucus or other substances surrounding the hookworms and protecting them from the action of the thymol. The patient is instructed to take little or no supper on the evening before the thymol is to be administered. As early at night as is convenient he takes a dose of Epsom salts. The next morning as early as the salts has acted, half the number of capsules of thymol prescribed for the whole treatment are taken. Two hours later the remaining capsules are taken. Two hours after the second dose of thymol, another dose of Epsom salts is taken, which will expel the hookworms that have been forced to loosen their hold on the intestinal wall by the action of the thymol, and will also get rid of the excess of thymol before it has had time to produce any harmful effects on the patient. Nothing is eaten on the day the capsules are taken until the final dose of Epsom salts has acted well. A little water or strong coffee, without milk, alone is allowed.

As alcohol and oils dissolve thymol, making it actively poisonous to the patient, the use of them in any form would be exceedingly dangerous. Gravy, butter, milk, all alcoholic drinks, and patent medicines, which generally contain alcohol, are forbidden on the evening before and on the day of the treatment. Moreover, as many hookworm patients have dilated stomachs which do not readily empty themselves

and it is important that the thymol reach the small intestine at once, the patient is advised to lie on the right side for at least half an hour after taking each dose of thymol.

The dosage administered by Drs. C. W. Stiles, George Dock, and C. C. Bass, by the State Boards of Health in the Southern States, and by a number of foreign countries, is outlined in the following table:

<u>Age, Years</u>	<u>Grains</u>	<u>Grams</u>	<u>6 a.m.</u>	<u>8 a.m.</u>
1 to 5.....	7.5	.5	$\frac{1}{2}$ dose	$\frac{1}{2}$ dose
5 to 10.....	15.	1.	$\frac{1}{2}$ dose	$\frac{1}{2}$ dose
10 to 15.....	30.	2.	$\frac{1}{2}$ dose	$\frac{1}{2}$ dose
15 to 20.....	45.	3.	$\frac{1}{2}$ dose	$\frac{1}{2}$ dose
20 to 60.....	60.	4.	$\frac{1}{2}$ dose	$\frac{1}{2}$ dose
60 and upward.....	45.	3.	$\frac{1}{2}$ dose	$\frac{1}{2}$ dose

It should be observed, however, that owing to the absence of hospital conditions and to the uncertainty in some cases that directions will be correctly followed, the dosage prescribed is usually from ten to twenty per cent less than that indicated in the foregoing table. The dose of thymol varies with the age of the patient. As the disease retards development and persons eighteen years old often have only the normal growth of thirteen, apparent and not actual age determines the dose. In all countries a competent physician supervises the treatment.

During 1915 a number of experiments were made with oil of chenopodium as a substitute for thymol. In Guatemala more than 9,000

persons were treated with this drug and particularly favorable results were obtained. It was reported to be fully as efficient as thymol in the treatment of uncinariasis, and a better remedy in the treatment of other parasitic infestations, especially ascariasis. Furthermore, this drug was found less trying on the patient, permitting a subsequent treatment within four days, which served to facilitate the work as well as to increase the number of subsequent treatments administered. Among these 9,000 persons only two cases of untoward symptoms were observed, both in children, in the form of temporary deafness lasting in one instance two weeks and in another four weeks.

The standard dosage of oil of chenopodium used in Guatemala is as follows:

<u>Age in Years</u>	<u>Drops</u>
4.....	5
5.....	7
6.....	10
7.....	11
8.....	12
9.....	14
10.....	15
11.....	16
12.....	18
13.....	20
14.....	21
15.....	22
16.....	24
17.....	25
18.....	27
19.....	28
20 and over.....	30

These are maximum doses. They may be administered at one time or may be divided into two parts and administered one or two hours apart. There is no noticeable difference in results by either method.

In Nicaragua and Costa Rica excellent results have also been reported with the use of chenopodium. In both countries the strong psychic effect produced by the expulsion of large numbers of round worms, plainly visible to the naked eye, is considered a decided advantage in favor of this drug. No untoward symptoms have been observed. In Nicaragua it has been customary to administer chenopodium for the first and thymol for all succeeding treatments.

In Trinidad, however, a series of experiments with oil of chenopodium gave less satisfactory results and led Dr. Washburn to conclude that there was nothing to justify adopting this drug in place of thymol as the standard remedy for uncinariasis. He finds it to be less effective than thymol and to produce more unpleasant symptoms, but recognizes that it may be used to advantage in selected cases where a large number of treatments with thymol fail to effect a cure.

For the experiments conducted in Trinidad 342 selected cases of uncinariasis were taken. These included patients who had had no other treatment for the disease, as well as patients who had had from two to eight treatments with

thymol previous to the administration of chenopodium. Of these 342 cases, 138 were treated by the Keith method, in which ten minims of chenopodium are given daily for three days, followed by a tablespoonful of castor oil two hours after the last dose has been taken; and the other 204 cases received the full dose on one day, followed in two hours by a large dose of castor oil. In some cases magnesium sulphate was used instead of castor oil without any appreciable difference in the result.

Of the 138 cases treated by the Keith method, specimens for re-examination were obtained from 113 three days after the last dose of chenopodium had been administered, as recommended by Dr. Keith, who states that in his experience it is rare to find the eggs of *Uncinaria* in stools examined three days after the last dose of chenopodium is taken. Specimens from the remaining 35 cases were not collected until the end of seven days following treatment, when all of the patients, including the 113 who had been re-examined at the end of three days, were re-examined. The results obtained at the end of three days and at the end of seven days following the last treatment are compared in Table 6. (See Table 6, page 218.)

Forty-six of the persons whose specimens were re-examined both at the end of three days and seven days following the last treatment, were found negative at the end of three days and

TABLE 6: *Trinidad—Intensive Work: Comparison of Results of Treatment with Oil of Chenopodium After Lapse of Three Days and After Lapse of Seven Days.*

	SPECIMENS EXAMINED	SPECIMENS POSITIVE		FOUND POSITIVE WITHOUT CENTRIFUGE		FOUND POSITIVE WITH CENTRIFUGE	
		No.	P. C.	No.	P. C.	No.	P. C.
Three Days Following Last Treatment.....	113	29	25.7	14	48.3	15	51.7
Seven Days Following Last Treatment.....	138	91	65.9	72	79.1	19	20.9

positive at the end of seven days, showing that the figures obtained by the re-examination of specimens at the end of three days are unreliable. This is probably due to the fact that the drug exerts a toxic effect on the female worms, causing them to lay no eggs for several days after the treatment. The fact that the specimens collected three days after treatment contained but few eggs is indicated by the unusually large percentage of specimens in which the eggs were not discovered until after the centrifuge had been used.

In the 204 cases to whom the full dose of chenopodium was administered on the same day, 74 were given 10 minims every hour for three hours, followed by a dose of castor oil after an interval of two hours; and 130 were given two capsules of 10 minims each with two hours' interval between, followed by castor oil. Re-examination after seven days showed 27 of the 74 persons treated by the first method, or 36.5 per cent, to have been cured; but this method had to be discontinued because of the large number of cases who were made sick and weak. Of the 130 cases treated by the second method, re-examination after seven days showed 37, or 28.5 per cent, to have been cured. The remaining 93 patients were given a second treatment one week later and it was found that 39 of these, or a total of 58.5 per cent of the original 130 cases, had been cured by the two treatments.

In all of the cases treated with oil of chenopodium in Trinidad, unpleasant symptoms, such as nausea, vomiting, weakness, dizziness, etc., were much more marked than with thymol, and the continued use of chenopodium in a district alarmed the people and made them afraid to take further treatment of any kind.

Experiments were also conducted in Trinidad for determining the efficiency of thymol when administered in capsule form with varying proportions of sugar of milk. Re-examinations were made in all cases after two treatments had been administered. The results show that the drug is much more effective when finely pulverized and mixed with at least an equal amount of sugar of milk. Among 325 cases treated with pure thymol, finely powdered, only 41, or 12.6 per cent, were cured by two treatments, while among 1,112 persons treated with finely powdered thymol mixed with equal parts of sugar of milk, 546, or 49.1 per cent, were cured by two treatments.

During September, 1915, a supply of thymol already mixed with sugar of milk and packed in capsules by the manufacturer was received. This thymol was not as finely powdered as that which had been previously compounded in Trinidad, and the proportions of sugar of milk to thymol, instead of being equal, were as follows:

10 grains thymol to $2\frac{1}{2}$ grains sugar of milk;
5 grains thymol to 5 grains sugar of milk (but
not finely powdered);
 $2\frac{1}{2}$ grains thymol to 1 grain sugar of milk.

The results following the use of this supply were far less satisfactory than had previously been obtained. In three districts only 76 persons among a total of 350, or 21.7 per cent, were cured by two treatments. The drug was re-compounded and mixed with equal parts of sugar of milk, when the number of cures following two treatments again rose to nearly 50 per cent.

V. ILLUSTRATIONS



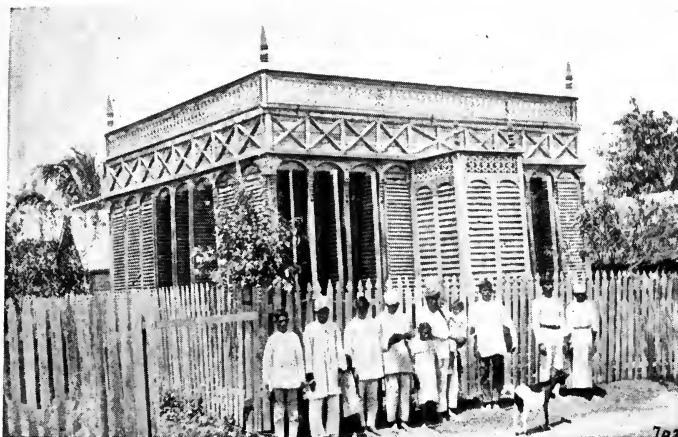


Fig. 1. Group of Mohammedans, all infected with uncinariasis. Mosque in background. British Guiana



Fig. 2. Mohammedan bishop and family. All cured of uncinariasis. Trinidad

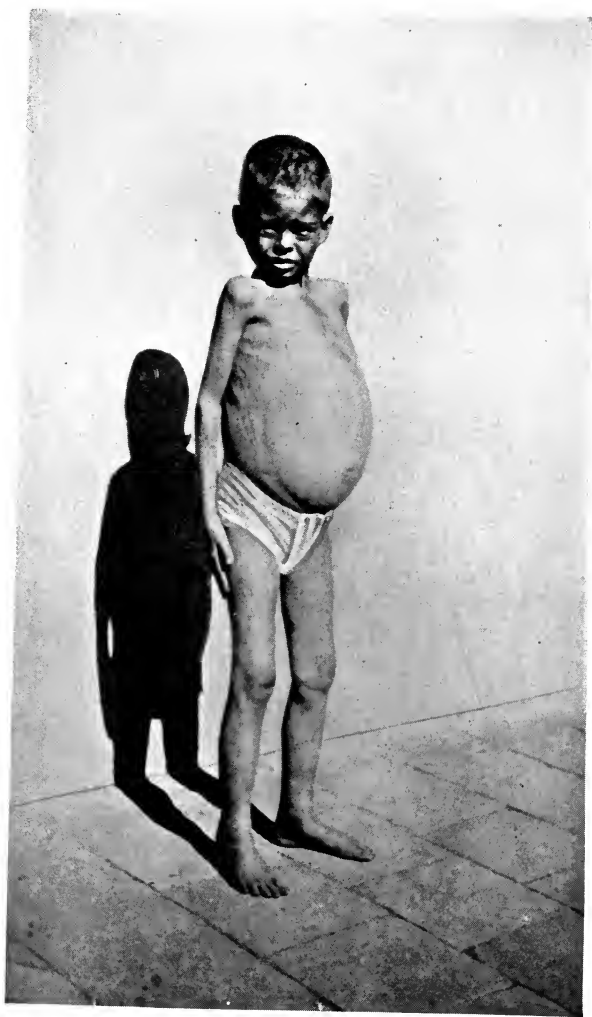


Fig. 3. Severe case of uncinariasis. Indian; age 17; weight, 42 lbs.
Guatemala



Fig. 4. Severe case of uncinariasis complicated by malaria. Patient rapidly recovering. Nicaragua

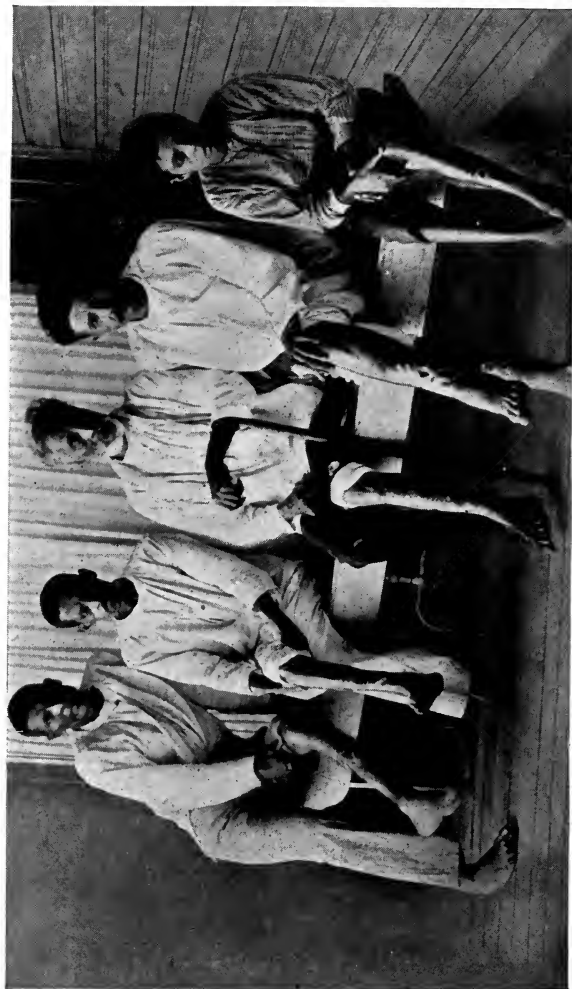


Fig. 5. Leg ulcers. Frequently associated with uncinariasis and aggravated by it. Costa Rica



Fig. 6. Two boys of the same age; the one on the right has uncinaria-
sis. Costa Rica



Fig. 7. East Indian named Seemungal. Severely infected with uncinariasis. A pauper, unable to work for six years; breech-cloth only clothing. Hemoglobin, 25 per cent.; red-blood-cell count, 2,000,000. Trinidad



Fig. 8. Same patient six months later, after being cured. He has changed his name from the common-place Seemungal to the more imposing Mr. Christopher Padmore, and finds employment delivering packages from the depot of the Government railway. A full suit of clothes has replaced the breech-cloth. Hemoglobin, 85 per cent.; red-blood-cell count, 4,100,000



Fig. 9. A family group. All infected with uncinariasis; all treated. St. Vincent

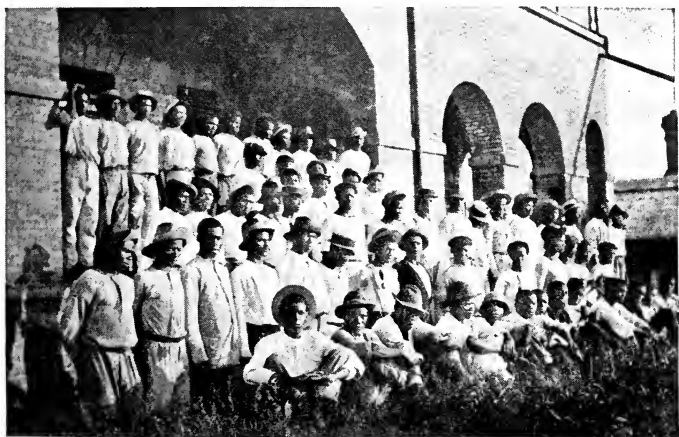


Fig. 10. Company of soldiers. Eighty-two per cent. infected with uncinariasis
Cured in one month. St. Lucia



Fig. 11. Dispensary group awaiting examination. Indians. Guatemala



Fig. 12. A group of Indians. All infected with uncinariasis; all being treated. Panama



Fig. 13. Joint conference, committee from National Board of Health and Department of Uncinariasis. Guatemala. Office of National Board of Health in background. (1) Dr. Mario J. Wunderlich; (2) Dr. Alberto Padillo; (3) Licenciado Juan Melgar, Committee-men from National Board of Health



Fig. 14. Taking treatment to the patients in their homes. St. Vincent



Fig. 15 Rear view of Fig. 14, showing method of carrying drugs and equipment



Fig. 16. Patient cured of uncinariasis, with certificate of cure. Grenada



Fig. 17. Two patients who walked for four days to receive benefits of treatment. Costa Rica

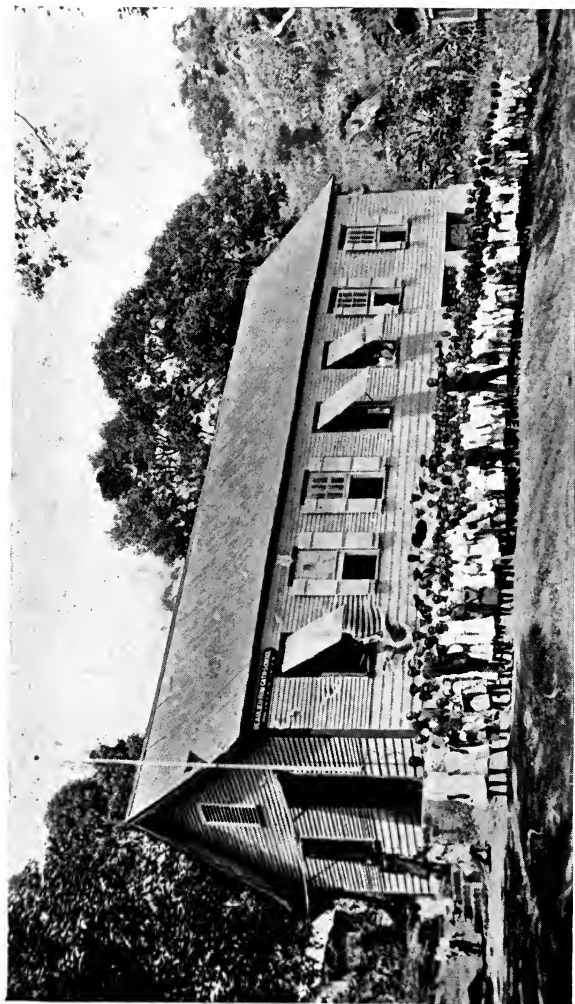


Fig. 18. School group attending lecture on uncinariasis. Grenada



Fig. 19. Staff for relief and control of uncinariasis in Trinidad, with Surgeon-General H. L. Clare (1) and Dr. C. B. Reid, District Medical Officer (2)



Fig. 20. Attendance at a lecture on uncinariasis. Costa Rica. The circle indicates the President of the Republic



Fig. 21. A lecture on uncinariasis illustrated with charts. Costa Rica

CHINA MEDICAL BOARD

Report of the Director



CHINA MEDICAL BOARD

Report of the Director

To the President of the Rockefeller Foundation:

Sir:

I have the honor to submit herewith my report as Director of the China Medical Board for the period extending from December 11, 1914, the date of the organization of the Board, to December 31, 1915.

Respectfully yours,

WALLACE BUTTRICK,
Director.

CHINA MEDICAL BOARD

OFFICERS

Chairman

JOHN DAVISON ROCKEFELLER, JR.

Vice-Chairman

FREDERICK TAYLOR GATES

Director

WALLACE BUTTRICK

Resident Director in China

ROGER SHERMAN GREENE

Secretary

EBEN CHARLES SAGE

Executive Committee

Wallace Buttrick	Starr Jocelyn Murphy
Frederick Taylor Gates	Francis Weld Peabody
John Davison Rockefeller, Jr.	

Members¹

To serve until the annual meeting of 1918

John R. Mott	Simon Flexner
Wallace Buttrick	Frank J. Goodnow

To serve until the annual meeting of 1917

William Henry Welch	John Davison Rockefeller, Jr.
Jerome Davis Greene ²	Wickliffe Rose

To serve until the annual meeting of 1916

Harry Pratt Judson	Francis Weld Peabody
Frederick Taylor Gates	Starr Jocelyn Murphy

¹ On January 26, 1916, the following additional members were elected: Roger Sherman Greene, to serve until the annual meeting of 1919, and Frederick Lamont Gates to serve until the annual meeting of 1918.

² Resigned May 26, 1915.

CHINA MEDICAL BOARD

ORIGIN AND PURPOSES OF THE BOARD

The origin and purposes of the China Medical Board are succinctly stated in the following letter, addressed by the President of the Rockefeller Foundation to the Missionary Societies in the United States and Great Britain which are conducting medical work in China:

“New York, March 15, 1915.

“My dear Sir:

“For some time the Rockefeller Foundation has been considering the need of scientific medicine in China and how best the Foundation might assist in meeting the need. A tentative general plan of procedure was adopted nearly a year ago, after conference with many eminent authorities on the subject. A competent Commission has since then visited China and studied with great care present medical conditions in that country. The Commission has now made a comprehensive report and has offered a series of recommendations. These recommendations have been tentatively adopted by the Foundation, subject to such changes as experience and further inquiry may suggest.

“Happily, the Foundation is not first in the field. Many and various missionary societies of America, Great Britain and the Continent have preceded it. Hundreds of physicians are now practicing in China under the auspices of these societies. Their patients number tens of thousands, perhaps hundreds of thousands, annually. As rapidly as possible, hospitals have been and are being established. In some cases these are fairly well equipped, but all of them are still very needy. Half a score or more of medical colleges have been started, partially manned and equipped, and these colleges are being availed of by hundreds of Chinese students, with such preparation, more or less adequate, as circumstances have admitted. The Missionary Boards have been most zealous in medical missions and have done everything possible, with the limited resources at their disposal, toward making

this work effective. With these societies and with the work undertaken by them, the Foundation from the first has contemplated the most cordial and sympathetic co-operation. We desire to supplement the work of the Missionary Boards where it is incomplete, to multiply it where it is inadequate, and always to engraft our additions in an entirely vital way. We cannot expect, even did we desire it, that the societies would materially change their principles or methods or the religious qualifications of their appointees, except as the societies may be self-moved to do so by experience and observation.

"But the medical work of the Missionary Societies and Boards is confined to limited areas and is seriously restricted by lack of funds. In carrying out its comprehensive plans, the Foundation may find it desirable:

"1. To assist Missionary Societies to strengthen their medical schools and hospitals by providing equipment and other facilities, and by making annual grants, as may be found expedient, for the support of physicians and nurses, selected by the respective Missionary Boards, subject only to the Foundation's approval of the professional qualifications of the appointees.

"2. With the consent of the Missionary Boards, to reorganize and expand existing medical schools, with their hospitals, and to support these, wholly or in part, from its own funds.

"3. To aid other medical schools that are not strictly missionary.

"4. To establish, equip and support new medical schools and hospitals. In choosing its agents, physicians and nurses for independent schools or hospitals, the Foundation will select only persons of sound sense and high character, who are sympathetic with the missionary spirit and motive, who are thoroughly qualified for their work professionally, and who will dedicate themselves to medical ministration in China. Beyond these qualifications, the Foundation cannot properly impose tests of a denominational or doctrinal nature, such as are deemed desirable by Missionary Boards for their own medical missionaries or agents.

"In entering upon its work, the Foundation will hope to avail itself of the long and valuable experience acquired by the Missionary Boards in the conduct of their medical missions, and will welcome their sympathetic counsel in all matters of procedure and administration.

"While this work of the Foundation will be limited to medical service, we believe it to be the highest duty and privilege of all men to cherish the spirit of Jesus, and ever to live and act in that spirit. The desire of earnest Christians to communicate the spirit of Jesus to the Chinese and to the whole world we share to the full. We share with the Missionary Boards also their conviction that the teaching of Jesus must be imparted to the Chinese through preaching and by all other proper agencies for communicating truth, and we are constantly mindful that, in so far as we may be able to assist the Missionary Boards in their medical service, the Boards will be enabled to devote added funds to the strengthening and enlarging of their educational and evangelistic work.

"As its agency for conducting this work, the Foundation has formed the China Medical Board, with offices at 61 Broadway, New York, and has conferred upon this Board the necessary powers and the financial resources believed to be currently needed. The Chairman of the Board is John D. Rockefeller, Jr.; the Director, Wallace Buttrick; Resident Director in China, Roger S. Greene, formerly United States Consul-General at Hankow, China.

"The members of the Board are:

Messrs. WALLACE BUTTRICK
SIMON FLEXNER
F. T. GATES
JEROME D. GREENE
HARRY PRATT JUDSON
FRANK J. GOODNOW
JOHN R. MOTT
STARR J. MURPHY
FRANCIS W. PEABODY
JOHN D. ROCKEFELLER, Jr.
WICKLIFFE ROSE
WILLIAM H. WELCH

"In behalf of the Rockefeller Foundation.

"(Signed) JOHN D. ROCKEFELLER, Jr.,
"President."

The Commission of 1914, referred to in the foregoing letter, consisted of Harry Pratt Judson, President of the University of Chicago, Dr. Francis W. Peabody, of the Harvard Medical School, Boston, and Roger S. Greene, then Consul-General of the United States at Hankow, China. This Commission visited the several medical schools in China and a large number of hospitals, missionary and other. Upon its return to the United States, the Commission made a comprehensive report to the Foundation, afterwards printed under the title "Medicine in China," and presented a series of recommendations, which were adopted at the meeting of the Foundation, November 5, 1914, under the following resolution:

"RESOLVED, That the Report of the China Medical Commission be accepted and the recommendations of the same be adopted as a working basis, together with the financial estimates with which they are accompanied, the whole or any part thereof subject to such changes and emendations as experience and further knowledge shall from time to time invite."

At a meeting of the Executive Committee of the Foundation, held November 30, 1914, the following further action was taken:

"RESOLVED, That an organization be created to take up the work of medical education in China, as recommended in the report of the China Medical Commission and in accordance with the resolution adopted at the meeting of November 5, and that such organization be designated as the China Medical Board of the Rockefeller Foundation."

The Board met for organization December 11, 1914, all the members being present with the exception of Dr. Wickliffe Rose, who was engaged in war relief work in Europe, and Dr. William H. Welch, who was unavoidably detained. Mr. Roger S. Greene was present by invitation. Mr. John D. Rockefeller, Jr., stated the circumstances leading to the formation of the Board and pointed out some of the questions which would confront the Board in formulating its policies. He urged that the work be undertaken in a spirit of coöperation with existing agencies for medical education in China, and particularly with the medical schools and hospitals established by the missionary societies.

The following officers were appointed:

Chairman, John D. Rockefeller, Jr.

Director, Wallace Buttrick.

Resident Director in China, Roger S. Greene.

Secretary, E. C. Sage.

Executive Committee: Wallace Buttrick, Frederick T. Gates, Jerome D. Greene, Starr J. Murphy, Francis W. Peabody, John D. Rockefeller, Jr.

On May 26, 1915, Mr. Jerome D. Greene resigned his membership in the Board, and on the same day Mr. Frederick T. Gates was appointed Vice-Chairman.

The Board has held three meetings: December 11, 1914, March 1, 1915, and May 25, 1915. The Executive Committee has held four

meetings: April 15, June 22, July 10, and October 27, 1915.

In July, 1915, Mr. Roger S. Greene sailed for China and as Resident Director opened an office of the Board in Peking.

UNION MEDICAL COLLEGE, PEKING

The first important act of the Board was the acquisition of the property of the Union Medical College in Peking.

This medical college, from which the first class graduated in 1911, was maintained and directed by six Christian Missionary Societies: The London Missionary Society (non-sectarian, but closely affiliated with the Congregational Churches of Great Britain), The Society for the Propagation of the Gospel in Foreign Parts (Church of England), The London Medical Missionary Association, The American Board of Commissioners for Foreign Missions (Congregational), The Board of Foreign Missions of the (American) Methodist Episcopal Church, and The Board of Foreign Missions of the Presbyterian Church in the United States of America. The property of the College was owned by the London Missionary Society, for which Society Dr. Thomas Cochrane established the work in 1906. Since that date the college has been supported jointly by the six missionary societies named above.

Early in 1915, the Director and Mr. Roger

S. Greene conferred with representatives of the three American Missionary Societies interested in the College, when it was agreed that the China Medical Board might approach the London Missionary Society with a proposal to purchase the property of the College. Under the instructions of the Board, the Director visited London in March and April, 1915, to negotiate with the London Missionary Society. While in London he attended several meetings for conference with officers and committees of that society, with representatives of the Society for the Propagation of the Gospel in Foreign Parts, and of the London Medical Missionary Association.

As a result of these conferences, the London Missionary Society agreed to sell the property of the Union Medical College in Peking, together with the mission compound of the Society, located on Hatamen Street, near the Medical College, to the China Medical Board of the Rockefeller Foundation, and later sent Dr. Thomas Cochrane, President *Emeritus* of the College, to this country with full power to act for the London Missionary Society in completing arrangements for the transfer of the property. On June 2, 1915, a memorandum of agreement between the London Missionary Society and the China Medical Board was executed, which provided for the sale of the property of the Union Medical College in

Peking and the mission compound mentioned above to the China Medical Board of the Rockefeller Foundation. Subsequently the titles to the property were perfected and the transfer and sale consummated.

The terms of the transfer provided, among other things, that the work of the college should be conducted by a Board of Trustees, which should consist of thirteen members, one to be appointed by each of the six missionary organizations theretofore maintaining the college, and seven by the China Medical Board. Under this agreement the following trustees have been appointed:

Representing the China Medical Board: Wallace Buttrick, Simon Flexner, Frederick T. Gates, John R. Mott, John D. Rockefeller, Jr., Wickliffe Rose, William H. Welch.

Representing the London Missionary Society: F. H. Hawkins.

Representing the Medical Missionary Association of London: Arthur Wenham.

Representing the Society for the Propagation of the Gospel in Foreign Parts: J. Auriol Armitage.

Representing the Board of Foreign Missions of the Methodist Episcopal Church: Frank Mason North.

Representing the Board of Foreign Missions of the Presbyterian Church in the United States of America: Arthur J. Brown.

Representing the American Board of Commissioners for Foreign Missions: James L. Barton.

The following are the officers of the Board of Trustees of Union Medical College:

Chairman, John R. Mott.

Vice-Chairman, James L. Barton.

Secretary, Wallace Buttrick.

Executive Committee: Frederick T. Gates, Chairman; Arthur J. Brown, Wallace Buttrick, Simon Flexner, Frank Mason North.

Committee on Nominations to the Faculty: Wallace Buttrick, Simon Flexner, William H. Welch, Frank Mason North, Arthur J. Brown.

On July 1, 1915, the China Medical Board assumed full support of the College, with an annual budget of fifty-three thousand dollars (\$53,000).

The Board has since purchased the residence property of Mr. Ying, adjoining the Union Medical College to the south, thus increasing the campus of the college by about one and two-fifths acres. Negotiations are also pending for the purchase of additional property adjoining the hospital of the college, belonging to Prince I, and for the extensive residence property of Prince Yu, some three hundred feet west of the laboratory building of the college, the latter being a tract of more than eight acres.

COMMISSION OF 1915

In May, 1915, the Board, by resolution, requested the Director, Dr. William H. Welch, of the Johns Hopkins Medical School, Drs. Simon Flexner and Frederick L. Gates, of the Rockefeller Institute for Medical Research, and Mr. Frederick T. Gates, Vice-Chairman of the Board, to visit China and report a definite program for the reorganization of the Peking

Union Medical College, and also to consider more particularly whether the Board might not organize a second college to be situated in Shanghai. On the 7th of August the members of the Commission sailed from San Francisco for China, returning December 27, 1915. At the last moment, Mr. Frederick T. Gates found it impossible to go.

During the five months of their absence from this country the members of the Commission visited medical schools and hospitals in Tokyo and Kyoto, Japan; Seoul, Korea; and the following places in China: Mukden, Peking, Tientsin, Tsinanfu, Hankow, Wuchang, Changsha, Nanking, Shanghai, Soochow, Hangchow, Hongkong and Canton. Mr. Roger S. Greene joined the Commission at Mukden and thereafter participated in their journeys and work. Dr. Frederick L. Gates was Secretary of the Commission and made a record of all its proceedings, which he has filed with the archives of the Board.

During their brief stay in Japan the members of the Commission were entertained by leading medical men of the country. They also met a number of prominent Japanese and foreign residents at a dinner given by Dr. Teusler, of the International Hospital, and later were entertained at luncheon by Count (now Marquis) Okuma.

Upon their arrival in China, the Commission

was welcomed by the American Minister, Dr. Paul S. Reinsch, and his associates of the American Legation, who in manifold ways aided the members in their work. At Peking they were entertained at luncheon by the Minister of Foreign Affairs, and through his courtesy and that of Dr. Reinsch they had the honor of an interview with the late President of the Chinese Republic, Yuan Shih-k'ai. The members of the Commission were also given a dinner by a large company of Chinese physicians, who expressed great satisfaction with the plans of the Rockefeller Foundation to introduce and to teach modern medicine in China and promised their cordial support.

The limits of this report forbid mention of many institutions and individuals who welcomed and furthered the work of the Commission. The faculty of the Union Medical College, Peking, coöperated with them wholeheartedly, the representatives of the several Christian Missionary Societies welcomed them warmly, and throughout their extended journey they found that the spirit of friendliness and helpfulness had gone before them. In Hankow they were entertained by the University Club of that city, of which organization their associate, Mr. Roger S. Greene, was the first President; in Changsha by the Military Governor, the chief executive of the city, the members of the Yale Mission and by a large

company of Hunanese gentry; at Shanghai by St. John's University, the Saturday Club, the University Club, the Kiangsu Educational Association (Chinese), the East China Missionary Educational Association, and by the executive secretaries of the several missionary organizations which have their headquarters in Shanghai; at Nanking by President Bowen and his associates of the Nanking University. At all places visited the representatives of missions, American and English, assisted the Commission in its work

This extended journey, with its opportunity for studying medical and other educational institutions and agencies in China, served the important purpose of giving the Director and three of his associates on the China Medical Board a first-hand contact with the people, cities and institutions of China. The Board is deeply indebted to Doctor Welch and Doctor Flexner for their services and to the Johns Hopkins University and the Rockefeller Institute for Medical Research for giving them leave of absence. Their presence on the Commission and the China Medical Board establishes the movement in the confidence of the medical profession throughout the world.

The Commission did not return to New York until January, 1916. Its specific recommendations, therefore, were not presented to the Board during the year covered by this

report. One or two important general recommendations should, however, appear in this statement.

SHANGHAI

While the members of the Commission were in Shanghai and Nanking, they consulted with Bishop Graves and Acting President Walker, of St. John's University; with Dr. Houghton and his associates of the Harvard Medical School in China, and with President Bowen and his associates of Nanking University. Under date of November 5, 1915, the following communication was received from Dr. Beebe, Secretary of the China Medical Missionary Association:

"5 Quinsan Gardens, Shanghai,
"November 5, 1915.

"Dear Dr. Buttrick:

"At a meeting of representatives, regularly appointed, of St. John's University, University of Pennsylvania Medical School, University of Nanking and the Harvard Medical School of China, the accompanying resolution was passed unanimously and I was instructed to bring the same to your attention.

"Very truly yours,
(Signed) "ROBERT C. BEEBE."

"Inasmuch as the China Medical Board of the Rockefeller Foundation has in view the establishment of a medical school in Shanghai which shall work in cordial and sympathetic coöperation with missionary societies, and in which it is desired to merge existing medical schools, the representatives of St. John's University and Pennsylvania Medical School of the University of Nanking, and of the Harvard Medical School of China, in a joint meeting, held in Shanghai, Thursday, November 4, 1915, extend a cordial invitation to the China Medical Board

to establish in Shanghai a Medical School which shall be conducted by a board of trustees upon which would be represented the governing bodies of the coöperating schools."

After consultation with his associates, the Director sent the following reply to Dr. Beebe's letter:

"Shanghai, November 7, 1915.

"Dear Dr. Beebe:

"Thank you for your letter of November 5th covering the resolution passed by the representatives of St. John's University, the University of Pennsylvania Medical School, the University of Nanking and the Harvard Medical School of China. This resolution will be presented to the China Medical Board at its meeting, which should be held the latter part of January, 1916, and you will of course be promptly advised of any action that the Board may take at that time relating to the matter.

"In the meantime, I might add that our Commission feels gratified that these organizations have, through this voluntary action, manifested their sympathetic interest in the larger scheme which we have in mind for the promotion of higher medical education in China.

"Thanking you and your associates for your manifold courtesies during our stay in Shanghai, I am

"Cordially yours,

(Signed) "WALLACE BUTTRICK."

At a meeting of the China Medical Board, held April 6, 1916, it was voted to establish a medical college in Shanghai, and a committee to select trustees and secure a charter for the college has been appointed.

CHANGSHA

Acting on the recommendation of the Commission of 1914, the Board has contributed

\$16,200 a year for five years to the Hunan-Yale Medical School at Changsha. The Commission of 1915 spent two days at Changsha and were much pleased with the progress that has been made in organizing the medical school as well as with the remarkable evidences of public-spirited coöperation on the part of the gentry of the province. The new site is a most desirable one, and the hospital promises to be one of the best in China. Dr. Welch laid the cornerstone of the new hospital while the Commission were in the city.

THE AIDING OF MISSIONARY HOSPITALS

In his letter to the Missionary Societies, the Chairman of the China Medical Board stated that in carrying out its comprehensive plans the Board may find it desirable "to assist Missionary Societies to strengthen their medical schools and hospitals by providing equipment and other facilities and by making annual grants, as may be found expedient, for the support of physicians and nurses selected by the respective Missionary Boards, subject only to the Foundation's approval of the professional qualifications of the appointees."

In carrying out this proposal, the China Medical Board has decided that it should first aid those hospitals which are easily accessible from the leading medical schools to be developed at Peking and in the lower Yangtze Valley.

This means hospitals in cities which can be conveniently reached by rail or water transportation within perhaps one or two days' journey from the cities where the schools are located. In pursuance of this general program, a few appropriations were made before the departure of the Director for China in August, 1915. Following are the hospitals thus aided:

NORTH CHINA

CHIHLI PROVINCE.

Shuntehfu—*Northern Presbyterian Board Hospital*—

May 25, 1915, appropriation for:

1 doctor, salary and expenses.....	\$2,400	
2 nurses, salaries and expenses.....	2,200	
1 residence.....	4,000	
		\$8,600

Paotingfu—*Northern Presbyterian Board Hospital*—

May 25, 1915, appropriation for:

1 doctor, salary and expenses.....	\$2,400	
2 nurses, salaries and expenses.....	2,200	
1 residence.....	4,000	
		\$8,600

Peking—*Northern Methodist Board Hospital*—

July 10, 1915, appropriation for:

1 doctor (general practitioner).....	\$2,400	
1 doctor (specialist in eye, ear and throat).....	2,400	
		\$4,800

Changli—*Northern Methodist Board Hospital*—

July 10, 1915, appropriation for:

1 additional physician.....	\$2,400	
1 additional foreign nurse.....	1,100	
		\$3,500

SHANTUNG PROVINCE.

Taianfu—*Northern Methodist Board Hospital*—

July 10, 1915, appropriation for:

1 additional physician.....	\$2,400	
1 additional foreign nurse.....	1,100	
		\$3,500

Another grant was made to the *American Board of Commissioners for Foreign Missions*, April 15, 1915, for:

North China (specific hospital not stated) as follows:

1 married doctor (man) salary and expenses.....	\$2,182	
1 unmarried woman doctor, salary and expenses..	1,054	
		\$3,236

CENTRAL CHINA

KIANGSU PROVINCE.

Soochow—*Southern Presbyterian Board Hospital*—

July 10, 1915, appropriation for:

1 doctor, salary and expenses.....	\$1,200
Outfit and travel for doctor.....	425
1 additional foreign nurse, salary.....	1,200
Outfit and travel for nurse.....	425
	<hr/> \$3,250

Nantungchow—*Foreign Christian Missionary Society Hospital*—

May 25, 1915, appropriation for:

1 nurse, salary and expenses.....	\$1,005
Outfit.....	100
	<hr/> \$1,105

ANHWEI PROVINCE.

Luchowfu—*Foreign Christian Missionary Society Hospital*—

May 25, 1915, appropriation for:

1 doctor, salary and expenses.....	\$2,190
Outfit for doctor.....	200
1 nurse, salary and expenses.....	1,005
Outfit for nurse.....	100
	<hr/> \$3,495

CHEKIANG PROVINCE.

Kashing—*Southern Presbyterian Board Hospital*—

July 10, 1915, appropriation for:

1 additional foreign nurse, salary.....	\$1,200
Outfit and travel to field for nurse.....	425
	<hr/> \$1,625

FELLOWSHIPS AND SCHOLARSHIPS

The Board has created a limited number of fellowships in the United States for graduates of Chinese Medical Colleges, and a limited number of scholarships for Chinese graduate nurses and pharmacists.

Under these fellowships and scholarships the following appointments have been made:

Fellowships for Chinese Graduates in Medicine:

Tsing-meu Li, M.D., of the Hunan-Yale Medical School, Changsha, Hunan.

Tsing-liang Li, M.D., of the Hunan-Yale Medical School, Changsha, Hunan.

E. T. Hsieh, M.D., Graduate Union Medical College, Peking, Chihli.

Sze-jen Shen, M.D., Graduate Harvard Medical School of China, Shanghai, Kiangsu.

Mary Stone, M.D. (Chinese), of the Methodist Hospital at Kiukiang, Kiangsi.

Tsung-hsien Tsen, M.D., Graduate Harvard Medical School of China, Shanghai, Kiangsu.

Ching Kiang (Peter Kiang), M.D., of the University of Pennsylvania, Philadelphia, Pa.

Scholarships for Chinese Nurses:

Lillian Wu, Women's Methodist Hospital (under the direction of Dr. Mary Stone), Kiukiang, Kiangsi.

Mildred Wu, Yale Mission Hospital, Changsha, Hunan.

Scholarships for Chinese Pharmacists—(\$600 each, with \$400 for travel to the United States and \$300 for the return journey): Tsung-yi Ch'eng, Yin-dah Hsi, Kyan-tsing How (June, 1916).

The Board has granted fellowships to a number of medical missionaries in order that they may pursue graduate work while on furlough. Dr. Adrian Stevenson Taylor, of the Southern Baptist Hospital at Yangchow, and Dr. Frederick E. Dilley, of the Union Medical College at Peking, received fellowships. Smaller grants which, without special authority, cannot exceed \$600, have been made from a fund of \$10,000

placed at the disposal of the Director, to the following persons:

J. Oscar Thomson, M.D., of the Canton Hospital, Canton, Kwangtung.

Allen C. Hutcheson, M.D., of the Southern Presbyterian Hospital in Kashing, Chekiang.

John Todd Anderson, M.D., of the Foreign Mission Board of the Southern Baptist Convention Mission Hospital at Chengchow, Honan.

CONCLUSION

Before closing this report, it may be well to refer to a few other matters, although they do not actually fall within the period under review. On April 6, 1916, the China Medical Board voted to support the Red Cross Hospital in Shanghai for two years, under the direction of Dr. Henry S. Houghton, for over three years head of the Harvard Medical School of China, which on June 30, 1916, terminated its useful career of the past five years. On April 6, 1916, the China Medical Board appointed Mr. Charles A. Coolidge, of Boston, Consulting Architect, and commissioned him to proceed to China, where, with the assistance of the Resident-Director, he is to study the conditions in Peking and Shanghai. In June, 1916, Dr. Franklin C. McLean, a graduate of the University of Chicago and of the Rush Medical College, and for the past year and a half Assistant Physician at the hospital of the Rockefeller Institute for

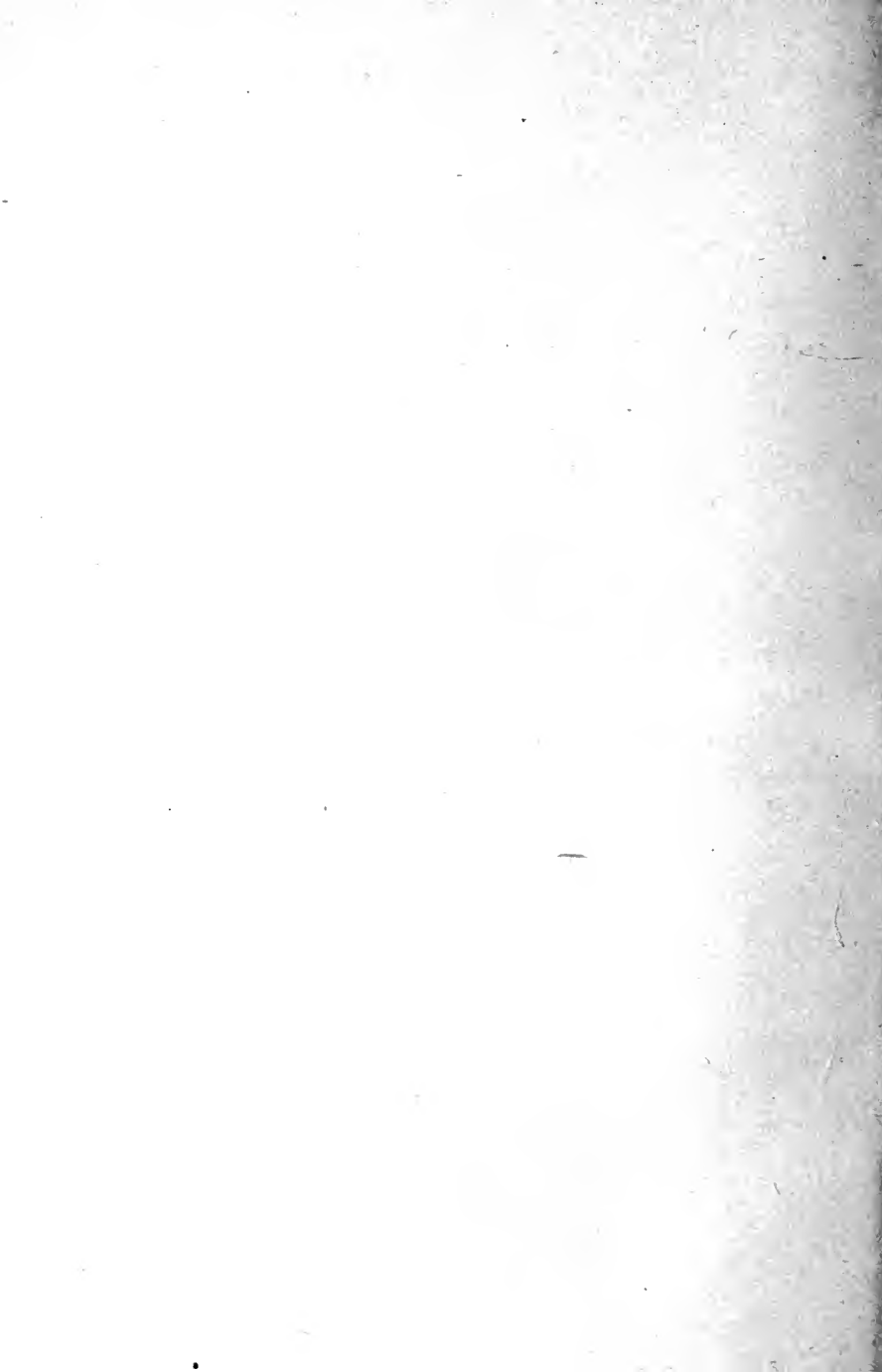
Medical Research, was unanimously selected as Professor of Internal Medicine and head of the Union Medical College in Peking. Dr. McLean and Mr. Coolidge sailed on July 13 from Vancouver for Yokohama, where they were met by Mr. Greene.

In conclusion, the Director wishes to record his appreciation of the friendly coöperation of the several Missionary Societies with the Board in their efforts to develop the science and practice of medicine in China.

WALLACE BUTTRICK,

Director.

WAR RELIEF COMMISSION
Report of the Chairman



WAR RELIEF COMMISSION

Report of the Chairman

To the President of the Rockefeller Foundation:

Sir:

I have the honor to submit herewith my report as Chairman of the War Relief Commission for the year 1915.

Respectfully yours,

WICKLIFFE ROSE,
Chairman.

WAR RELIEF COMMISSION

MEMBERS

Chairman

WICKLIFFE ROSE

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WAR RELIEF COMMISSION

ACTIVITIES IN 1914

In the first annual report of the Rockefeller Foundation appears an account of the activities of the Foundation during 1914 in the relief of suffering caused by the war. These activities are briefly summarized below in order to promote a clearer understanding of the work of the Foundation throughout the past year.

1. The Foundation, coöperating with the Commission for Relief in Belgium, provided the greater part of five cargoes of food and other supplies for Belgian relief. These supplies cost approximately \$1,000,000.

2. An appropriation at the rate of \$20,000 a year was made to provide stipends for certain professors in Belgian universities who were refugees in England.

3. Dr. Alexis Carrel, a member of the Rockefeller Institute for Medical Research, whose services had been accepted by the Medical Corps of the French army, was provided with funds enabling him to respond to urgent calls for anti-meningitis serum and anti-dysentery serum.

4. The American Red Cross was given \$10,000 to meet the expenses of sending a detachment of physicians and nurses to Europe.

5. A War Relief Commission was organized and sent to Europe to inquire generally into the need of relief measures in all the countries affected by the war. In November and December, 1914, this Commission made a survey of the organization and working of relief in Belgium and Holland and transmitted to the Foundation a full report of its observations and recommendations.

During 1915, the field of war relief work widened rapidly. One or more of the members of

the War Relief Commission visited each of the countries engaged in the war. They reported fully upon the conditions observed and made numerous recommendations to the Foundation regarding possible relief activities. Apart from the reports received from the Commission, the Foundation was informed by numerous individuals and war relief agencies of conditions of widespread and appalling distress among refugees in various countries of Europe and Asia. The conditions existing in the different areas affected and the aid given by the Foundation are here described.¹ For convenience, the account of the work in each country is given separately.

NORTHERN FRANCE

To the summary of the war relief activities of the Foundation during 1914 must be appended an account of a tour of inspection made by the War Relief Commission in the latter part of December, 1914, in that portion of French territory which lay between the battle front and the frontier of Belgium and was in the control of the German military authorities. The inquiry began on December 17th, at Valenciennes. From there the tour extended northeast to Douai, south as far as St. Quentin, east and southeast to Rethel, then northeast to Sedan, then north-

¹ A statement of expenditures made by the Rockefeller Foundation for war relief work during 1914 and 1915 will be found in the Appendix, page 354.

west and north to Fumay and Givet. From Givet the Commission returned to Brussels via Philipville and Charleroi on December 21st.

As a result of this inspection, the members of the Commission were strongly impressed with the importance of providing early relief for the people in this French territory, cut off as they were from their central government, from their banking connections, their markets, and their chief source of supplies. Upon their return to Brussels the Commission took the matter up with the Belgian National Committee and with the German authorities.

The National Committee of Belgium (*Comité de Secours et d'Alimentation de Belgique*) is an organization of Belgians, representing all political parties and the leaders of Belgian business and finance. The Committee apportions to the provinces of Belgium the supplies which are procured and transported by the Commission for Relief in Belgium and supervises the distribution of the supplies to the people within the communes.

The National Committee hesitated to assume jurisdiction for relief purposes over the strip of French territory occupied by the German army, but after some discussion with the members of the War Relief Commission the Committee agreed to forward relief supplies through their regularly organized machinery, treating the territory exactly as though it were a part of

Belgium. The Committee announced, however, that their action did not establish a precedent as to any other section of France, and that this strip was taken in solely because it was isolated from France by the destruction of all means of transportation from the south. Under the arrangement agreed upon, food was sent into the French towns from the Belgian provincial headquarters at Namur.

THE RELIEF OF BELGIAN REFUGEES IN HOLLAND

Following the occupation of Belgium by the German forces, probably 800,000 Belgians crossed the border and sought refuge in Holland. The people fled in panic, carrying few of their belongings. A majority seemed to have saved nothing beyond the clothing they wore. The Queen of Holland issued a proclamation welcoming the refugees and promising shelter and protection to all.

It quickly became evident that private resources could not meet the situation thus suddenly created. Relief committees were organized in many cities and towns, contributions were called for, and systematic efforts to feed and shelter those who could not be taken into private houses were promptly set on foot. In a few weeks it became necessary to relieve many households of the heavy burden of expense and the serious inconvenience which they had generously assumed. Thus more and more of the

refugees were gathered into large buildings or camps, where they were provided with beds and food by local committees. A national committee was organized, with headquarters in Amsterdam, and this committee undertook to do something toward raising relief funds and creating a supply of clothing from which the meager resources of the local committees might in some measure be supplemented. All these efforts fell far short of meeting the situation, especially as a large and increasing stream of refugees flowed from private houses into the shelters provided by the committees.

Eventually the Netherlands government assumed the greater part of the burden. It began by making a small per capita allowance for the feeding of refugees, but quickly followed this by the adoption of a policy of creating large concentration camps, into which it caused to be transferred the refugees from the small camps maintained by local relief committees. The government also assumed the expense of administering the camps and of feeding their occupants.

Many refugees later returned to Belgium, others went to England and a few were able to assume their own support. By January 1, 1915, the number of Belgian refugees in Holland had fallen to between 250,000 and 400,000.

The cost to the Netherlands government of this great charity was so large as to necessitate

the issue of bonds as a means of obtaining the money necessary to support the work of relief. At the concentration camps, large private and public buildings were occupied, when available, and elsewhere temporary wooden barracks were constructed, provided with simple equipment for meeting the primary human needs. A Royal Commission was created to represent the government in the direction and supervision of the camps.

In the latter part of November and early December, members of the War Relief Commission of the Rockefeller Foundation inspected several of the refugee camps in Holland and conferred with officers of a number of local relief committees. The enforced idleness of the inmates deeply impressed the Commission. It was evident that no means of providing wholesome employment had been devised, and, indeed, the difficulties in the way of employment were serious. Holland was suffering a business depression as an immediate effect of the war, and was struggling with a heavy problem of unemployment among her own people. At the same time, it was obvious that months of idleness in the enervating atmosphere of the camps could not but have a deteriorating influence upon the refugees.

In December, the Commission appointed Mr. Charles Jenkinson as its special representative in Holland, and upon his arrival toward the end

of the month he was set to work investigating conditions in the refugee camps. The following facts were brought out by this investigation:

1. The Netherlands Government was prepared to provide shelter and food for the refugees but did not feel that it could do more.
2. Refugees were suffering intensely for lack of warm clothing, a need which the local relief committees were trying vainly to meet. Many cases of disease due to exposure were reported, and mortality was abnormally high.
3. Enforced, universal idleness was threatening to undermine the energy and character of the refugees.

Before Mr. Jenkinson's investigation, the War Relief Commission were informed by officers at the Rotterdam office of the Commission for Relief in Belgium that large shipments of clothes (chiefly second-hand) intended for the Belgians were arriving at Rotterdam. As the Commission for Relief in Belgium were not prepared to handle clothing, these shipments were going into Belgium in an unsystematic way, and were, in fact, accumulating rapidly in a temporary warehouse in Rotterdam. It was apparent also that a fair proportion of the clothing should be distributed to the refugees in Holland. An inspection of this contributed clothing, however, revealed very little underclothing.

After considering the conditions disclosed by these investigations, the War Relief Commission undertook to classify, pack and re-ship the clothing contributed from all parts of the world,

apportioning it properly between Belgium and Holland; and also, as an experiment, to provide employment for some of the idle refugees by giving them an opportunity to make clothing for themselves and their compatriots.

DISTRIBUTION OF CLOTHING

By arrangement with the Rotterdam office of the Commission for Relief in Belgium, Mr. Jenkinson was appointed to take charge of all contributed clothing. The clothing which was coming in had been sent from the United States, Canada and England. It was of good quality and much of it absolutely new. Only a small portion of it, however, was packed, classified and marked in such a manner as to make it possible for those in charge of the distribution to know what was contained in any given case. To classify and distribute this clothing the War Relief Commission were given free use of a small warehouse in Rotterdam. When this warehouse was opened it was determined that as far as possible the labor should be performed by Belgian men and women, refugees from Belgium, who might in that way be enabled to support themselves. Men to handle the cases and women required for sorting and packing the clothing were quickly secured from among refugees in the neighborhood. Besides a small compensation given these Belgians for their work, they were also allowed, each Saturday

night, to take home one large piece of clothing, according to their requirements. Accurate records were kept of the articles taken by each employee and nobody was allowed to take the same article of apparel twice.

The warehouse was large enough to allow from 150 to 300 cases of clothing to be made ready for shipment each working day. Early in January, however, it was decided to hasten the work of assorting and distributing the clothing in order that the Belgians might get the benefit of the heavy clothing while the weather was still cold. Another warehouse was therefore secured, with a capacity of from 300 to 550 cases of clothing each day, and the force of employees was materially increased. During the life of this organization a number of people varying from 50 to 100 were given employment for periods ranging from one to five months each.

Following is a summarized statement of the distribution of clothing made by the Rotterdam organization:

Country	Number of Articles of Clothing
Belgium.....	1,605,142
Holland.....	364,021
Northern France.....	50,612
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Total.....	2,019,775

In addition to the clothing, 357 cases of food

and 1,483 cases of toys and miscellaneous articles packed with the clothing were also handled.

On April 20, 1915, work having fallen off, Mr. Jenkinson closed the larger of the two warehouses used for the sorting and re-packing of clothing. On May 12th, the Commission for Relief in Belgium stated that they knew of no further shipments of clothing consigned to Rotterdam, but that if additional shipments were received they could be handled efficiently in Brussels. The clothing department was therefore closed.

The War Relief Commission, in attempting to provide work for some of the refugees, asked the Committee in charge of a concentration camp in Rotterdam to coöperate in establishing a sewing department. All the women in the camp were called together and asked as to their ability to use sewing machines, to sew by hand and to knit. They were also asked whether they would be willing to help manufacture underwear, not for their own use alone, but for the use of other refugees. Their response was so prompt and hearty that the Commission was encouraged to go forward with the experiment.

A professional dressmaker from Brussels, herself a refugee, was engaged as supervisor of the first class, which was also under the supervision of a committee of Dutch ladies. Light, airy rooms were set aside for the sewing. Fifty

women entered the class. Material was provided and twelve sewing machines were installed, together with other necessary equipment, such as scissors, needles, thread, etc. A supply of woolen yarn was provided for women and girls who could not sew, but who could knit stockings. From the first the experiment was successful. The manager of the camp was enthusiastic over the better spirit which appeared among the women. Steadily, but with no great rapidity, new, warm garments accumulated. Careful accounting was made for all goods provided. The scraps from cutting were saved and groups of young girls and children were set to piecing quilts from them. This class, in one week, produced 459 articles of clothing, two-thirds of which were drawers and undershirts for men and one-third assorted articles for women and children.

When the Rotterdam experiment was in full operation, the Chairman of the Commission, in company with the American Minister at the Hague, called upon the Foreign Minister, and explained fully the industrial venture established in the camp in Rotterdam. The Minister was much interested and asked whether the Commission would be willing to extend their operations into other camps. This the Commission agreed to do.

As the winter was far advanced and the need for underwear extreme, it had seemed unwise to

rely solely upon the supply to be manufactured in the camps and the small quantities included in the contributed shipments of clothing. The Commission accordingly purchased, on bids from local manufacturers, about 10,000 suits of underwear for distribution in the various camps where extreme instances of individual need were reported.

Under the plan of the War Relief Commission, approved by the Netherlands Government, work-rooms were provided by the different communities or camps. The Commission furnished supervisors, sewing machines, materials and compensation for the workers. In accordance with this arrangement the work was rapidly extended to all the eleven provinces of Holland. Thirty-five sewing classes, in as many different places, were established within a few months.

Approximately 4,000 women worked in these sewing and knitting classes. For each group of 100 workers a supervisor was employed, who received a bonus running from \$2.80 to \$3.60 per week. A bonus of about forty cents a week was paid to each worker. In order to earn this bonus the workers were required to work six hours a day six days a week. During the five months of operation the classes produced approximately 100,700 pieces of underwear, 28,000 pairs of socks and about 26,000 miscellaneous garments.

In establishing sewing and knitting classes for

the Belgian refugees in Holland, the Commission kept constantly in mind the fact that nothing should be done to encourage the refugees to stay in Holland later than the earliest date on which it was practicable for them to return to Belgium. Unquestionably the work could have been greatly extended. Twenty thousand sewing and knitting workers could have been secured as easily as the 4,000 who were organized into classes. Shoe shops and clothing shops could have been established in the different camps to give employment to men. The Commission felt, however, that in the very success of the work lay its danger. Its continuance would have encouraged the Belgians to stay away from their country. With this belief in mind the Commission ordered the work to be brought to a close on June 5th. When the Commission announced in April its intention of bringing the work to a close, the Netherlands Government arranged to take over the classes as part of its programme of relief. Upon the announcement of the intention of the Government, every attempt was made to facilitate the transfer. Purchasing and distributing arrangements had already been greatly simplified. Efforts were made to provide a greater variety of materials. The Commission purchased outright the 498 sewing machines which were held under a lease and lent them to the Dutch Government for the continuance of the work.

The total expenditures on account of relief work in Holland were \$82,370.07, classified as follows:

Administration.....	\$9,506.00
Distribution of Clothing.....	9,155.15
Sewing and knitting classes.....	62,617.43
Miscellaneous.....	1,091.49
	<hr/>
	\$82,370.07

Of this amount, 49 per cent was spent for cloth and wool, and 20 per cent was spent for wages and bonuses.

The work of the War Relief Commission in Holland was greatly simplified by the coöperation of the Government. Both the Government Committee for the Relief of Belgians and the National Committee for the Relief of Belgians placed the facilities of their organizations at the disposal of the Rockefeller Foundation. Baron E. Van Tuyll Van Serooskerken was appointed as the official delegate and representative of the Government and the two committees to assist the Foundation in its work.

CLOTHING FOR THE DESTITUTE IN BELGIUM AND NORTHERN FRANCE

In the latter part of November, 1915, the Commission for Relief in Belgium announced that the problem of clothing the destitute people in Belgium and Northern France was rapidly becoming acute. Reports from their relief

depots indicated that the stocks of clothing in Belgium would probably be exhausted by the end of the year, while in Northern France the need was even more urgent, as practically no clothing had been distributed there. The Commission estimated that \$4,000,000 worth of clothing would be required to meet the needs of the destitute in the two areas. The Rockefeller Foundation was asked to make a contribution toward the amount required. After carefully considering the information submitted in support of the application, the Executive Committee, on December 3d, appropriated \$200,000 to the Commission for Relief in Belgium "for the purchase of material for clothing, the same to be imported by the Commission into Belgium and there manufactured by Belgian labor." While the members of the Executive Committee felt amply justified by the known facts in making this appropriation, they believed that any further aid to Belgium should be based upon a thorough study of the situation by a representative of the Foundation. Accordingly, on December 15, 1915, they appointed to act for them Mr. Frederic C. Walcott, a member of the firm of William P. Bonbright & Company, Bankers, of New York. Mr. Walcott was in France at the time of his appointment and undertook at once to make the desired investigation. It had not been completed at the end of the year.

STIPENDS FOR BELGIAN PROFESSORS

The quarterly grant of \$5,000 made by the Foundation to provide stipends for Belgian professors of scientific subjects who are refugees in England was continued throughout 1915.

POLAND

At a series of conferences held in Berlin in January, 1915, the conditions existing in that part of Russian Poland held by the German and Austrian armies of occupation were discussed with members of the War Relief Commission by German Government officials and others.

Following the conferences, the War Relief Commission traversed the territory occupied by the German and Austro-Hungarian armies. Throughout the territory examined the Commission found all industries stopped and the people idle. Many of the towns had no oil for lighting and no coal for heating or cooking. In many places the people were living upon potatoes or upon small quantities of supplies given to them by the soldiers. It was estimated that about three millions of people in the occupied territory were facing famine. Everywhere the distress seemed more extreme than it had been at any time in Belgium and with far less resisting power on the part of the people.

When the Commission returned to Berlin, and after discussions with representatives of the German and Austro-Hungarian governments

and the Spanish and American Ambassadors, an agreement covering the administration of relief in Poland was tentatively drafted. Following is a brief outline of the principal features of the plan:

1. It was proposed to create three groups of agencies:
 - a. Committees to collect money with which to purchase and transport food.
 - b. An International Commission for Relief in Poland, to serve as a neutral agency to purchase and distribute food supplies.
 - c. Local relief committees in Polish cities and villages to distribute food to individuals and to establish a system of payment for food by all having sufficient means.
2. The German and Austro-Hungarian governments were expected to agree:
 - a. To requisition no food within the territory covered by the relief operations excepting in that actually occupied by their troops.
 - b. To requisition no money in any part of the occupied territory.
 - c. To furnish agents of the International Commission for Relief in Poland with passes and facilities enabling them to supervise the transportation and distribution of supplies and to satisfy themselves of the observance of the agreements regarding the requisition of food and money.
 - d. To carry free of charge the personnel of the Commission, their baggage, and all supplies to be distributed.
 - e. To recognize only the Commission for Relief in Poland for the purpose of delivering supplies in Poland.
 - f. To accept as final the decision of the Chairman of the Commission upon questions arising in connection with the work of the Commission.
 - g. To coöperate with Poland in devising a method by

which the resources and credit of the Polish people might be made available toward financing the work of relief.

3. The War Relief Commission proposed, in the event of the adoption of the foregoing guarantees and plan of organization:

a. To supply the administrative expenses of the International Commission.

b. To endeavor to establish a channel through which food supplies might be imported from neutral countries under the governmental guarantees described above.

c. To make such contributions to the relief funds as might be warranted by:

1. The coöperation and efficiency of the governments and committees mentioned in the agreement.

2. The needs of the people in Poland.

3. The means at the command of the War Relief Commission.

This proposed agreement was considered by the Trustees of the Foundation at a meeting held March 2, 1915. It was decided that the Foundation could not assume the grave responsibility of forming and conducting an agency for relief in Poland, but if a satisfactory neutral agency were formed the Foundation would contribute \$10,000 a month for twelve months for the administrative expenses of such an agency.

Some weeks later, the Commission for Relief in Poland was organized substantially in accordance with the plan which has been outlined. A number of attempts were made by officials of the Commission to purchase grain for use in Poland. Grain could have been purchased in

Russia, but it was impossible to arrange for its transport. For one reason and another vigorous efforts made in various other countries to secure an adequate supply of grain suitable for use by the Poles proved unsuccessful. Finally, in May, the members of the War Relief Commission were informed that the German Government had completed another inventory of her food supplies and had found that there was enough food in the country to support the population until the following November. This assurance had led the Government to the conclusion that enough food could be spared from the German supply to support German Poland until the new harvest, in connection with such supplies as Poland herself might obtain. Following this announcement the Commission for Relief in Poland withdrew from any further attempt at that time to be of assistance in German Poland. A few weeks later the negotiations between the Austro-Hungarian Committee and the Commission for Relief in Poland were likewise discontinued.

EAST OF THE FIGHTING LINE IN POLAND

In examining into the general conditions existing in Eastern Poland, the War Relief Commission found that not fewer than 200,000 destitute refugees had fled into Warsaw and that proportionate numbers had crowded into many other towns and villages. The widespread distribution and general character of the exodus

were indicated by the fact that the Central Citizens' Committee, the largest relief agency operating in Warsaw and the surrounding territory, had found it necessary to establish subsidiary committees in over five hundred different communities.

The War Relief Commission reported that it would make only for waste and confusion to create new relief agencies for Eastern Poland. The Central Citizens' Committee and the organization in charge of relief for the Jews were well organized and fully accepted by all concerned. The Commission confined itself, therefore, to a report upon the relief agencies operating in the territory and upon the character and extent of the need.

The information contained in this report was transmitted by the Foundation to the principal relief agencies in this country which were concerned in sending aid to Eastern Poland and Galicia. With this knowledge at their disposal the relief committees were aided in securing considerable sums of money from the American public for transmission to the proper organizations in Russia and Eastern Poland.

SERBIA

In February, 1915, members of the War Relief Commission visited Serbia to inquire into the destitution reported in that country. During the progress of the war between Serbia and Aus-

tria-Hungary up to that time, the military forces of the latter had twice invaded northwestern Serbia and both times had been withdrawn across the border. These successive invasions had wasted the land traversed by the contending armies, while the population had fled to the southward and found refuge among the towns and villages beyond the invaded territory.

The members of the Commission learned that since the second withdrawal of the Austro-Hungarian forces many of the Serbians had returned to their destroyed homes, and were reported to be suffering from want of shelter, clothing and food. The refugees who remained in the scattered communities to which they had fled, when driven southward, had some sort of shelter, but in other particulars were in as much want as their neighbors who had returned to their homes.

The difficulties of travel in Serbia were such that it would have required several weeks to enable the War Relief Commission to make a comprehensive first-hand investigation of the actual living conditions of the people. The aspect and conditions of places which the members of the Commission did see induced them to accept statements that were made that much need existed among many thousands of Serbians—probably 300,000 or more. Indeed such opportunities as the Commission had to observe conditions prepared them to believe that the des-

titution in Serbia was more extreme than that which they had found elsewhere.

The Commission learned that the plight of the people was aggravated and complicated by the prevalence of epidemic disease among them, which they were apparently quite unable to control. At the time of the Commission's visit, typhus, typhoid and recurrent fever were epidemic in Serbia, and smallpox and scarlet fever were present in some communities. Cholera was expected with the warmer weather of spring. It was evident that the three epidemic diseases were distributed throughout the country. All of them were found in the communities visited by the Commission and in all the larger hospitals. In mortality, typhus was far in the lead.

It was impossible to obtain comprehensive or reliable statistics of the extent or virulence of the epidemics. One report indicated that in the military hospitals alone there were 33,000 sick patients, of whom 11,000 were suffering from epidemic diseases. This report did not include the hospitals for non-combatants, the sick in homes or the sick among the Austrian prisoners. Estimates based on inadequate information placed the total number of typhus cases in Serbia at 25,000 to 30,000, and while the figures could not be regarded as other than largely conjectural, it was feared that they could not be far in excess of the truth. Up to March, no serious effort had been made to check the

epidemic with the exception of the establishment of an isolation hospital at Skopje.

Perhaps nothing more strikingly illustrated the universality of the typhus infection and the difficulty of escaping it than the inroads which it had made upon doctors and nurses. Normally, Serbia has had not more than 400 physicians, a very small number for a population of four and a half millions. During January and February 60 of these physicians died of typhus and during the stay in Serbia of the members of the War Relief Commission they were told daily of the death of others.

Three medical groups had been sent to Serbia from the United States by the American Red Cross. Two of the groups were combined, with a total personnel of six doctors and twelve nurses, and were placed in charge of a hospital in the town of Djevdjeli containing 1,000 patients. Three of the doctors and nine of the nurses contracted typhus. One doctor had died of the disease when the Commission was in Serbia and several nurses were very ill.

A British Red Cross medical group of eighteen members was stationed at Skopje. Three died of typhus and all but three of the others were ill with the disease when the Commission was in that city.

This great mortality among the already inadequate force of doctors was rapidly reducing the ability of Serbia to grapple with the epidemic

herself. More than half of the total number of doctors were with the army at the front, or in the military hospitals. Trained nurses, as they are known elsewhere, were unknown in Serbia, except as a few had been brought in by the medical groups from other countries.

The conditions which have been described indicated to the members of the Commission that widespread as was the destitution reported to them, the greater and more urgent problem was that of controlling the epidemics. In fact, the problems of destitution and health were inextricably interwoven, and it was evident that no general measures for the relief of destitution could be effected until health conditions were radically bettered. On the other hand, a reduction in the amount of sickness and death would inevitably lighten the burden of present and future destitution.

Consideration of these facts, daily impressed more deeply upon the minds of the members of the Commission, led them to the conclusion that any help which the Foundation might be disposed to give in Serbia should first be devoted to the direction and support of a strong, systematic fight upon the epidemics which were threatening to envelop the entire nation.

Accordingly, on March 4th, the Commission sent a cablegram to the Foundation summarizing the facts regarding destitution and disease in Serbia, and stating that an expert organizer

of sanitary relief could accomplish important results if adequately supported, but that he would have to import assistants and supplies for a large work. The Commission stated further that sanitary work would have to include both soldiers and civilians, and requested to be advised on what scale, if at all, the Foundation was prepared to engage in relief under the conditions described.

Recognizing the menace to the health, not only of the Serbian people, but of the whole world, presented by this terrible condition in Serbia, the Executive Committee of the Foundation instructed Mr. Wickliffe Rose to confer with the officers of the American Red Cross in Washington and to ask whether the Red Cross would be willing, if financially aided by the Foundation, to send a Sanitary Commission to Serbia. This inquiry was considered by the Executive Committee of the American Red Cross at a special meeting held on March 6th. The Committee decided to appropriate \$25,000 for work in Serbia and agreed to disburse such funds as the Rockefeller Foundation or any other agency might donate. Inquiry by the Red Cross brought a cable from the Serbian Government inviting the presence of an American Sanitary Commission which, the Red Cross was assured, would be fully empowered to institute vigorous measures to cope with the epidemic.

The Executive Committee of the Foundation

thereupon appropriated \$25,000 for expenditure under the direction of the American Red Cross toward the support of the proposed Sanitary Commission. Immediately following the decision by the Foundation and the American Red Cross to send a Sanitary Commission to Serbia, the work of organizing the Commission was energetically prosecuted. After careful inquiry as to the availability of a number of men whose names had been suggested for the work, the American Red Cross appointed Dr. Richard P. Strong, Director of the Harvard University School of Tropical Medicine, as Director of the Sanitary Commission. Dr. Strong started abroad on March 17th, ahead of his American associates, taking with him an initial supply of 10,000 anti-cholera treatments. On April 3rd nine members of the Sanitary Commission left this country bound for Serbia.

On May 15th, a large party of physicians and skilled sanitarians, some of whom had worked under Surgeon General Gorgas in the Canal Zone, left for Serbia to join the Sanitary Commission. Others followed from time to time as Dr. Strong cabled for further assistance. There were forty-three members of the Commission in all.

Upon learning that the Rockefeller Foundation and American Red Cross had decided to send a Sanitary Commission to Serbia, the members of the War Relief Commission pro-

ceeded to London. They were informed there that thirty British physicians had been sent by the army to Serbia and had already reached their destination. In his visit to France, Mr. James, of the War Relief Commission, had learned that the French were planning to send 100 physicians.

It was obvious to the War Relief Commission, first, that the help of all the countries furnishing aid would be none too great to cope with the Serbian situation; and, second, that unless a unified and coördinated effort were made by all concerned, the work would be inadequately done, and friction would be reasonably certain. The members of the War Relief Commission thereupon bent their energies toward bringing about a mutual understanding and agreement among the three Serbian sanitary expeditions. A number of conferences were accordingly held for the purpose of working out a plan for united effort in Serbia.

These conferences brought out the fact that five separate British agencies were at that time engaged in some form of relief work in Serbia, and that they were working entirely independently of each other. The effort of the Foundation and American Red Cross to establish a close coördination in the Serbian work led to the calling of a meeting of representatives of all the British societies. Mr. Bicknell, of the War Relief Commission, was present at this meeting

by invitation. After long discussion, it was proposed that an Executive Committee of three members be formed, consisting of one representative of the British group of societies working in Serbia, one representative of the French agencies in Serbia, and one representative of the American agencies. Mr. Bicknell accepted this arrangement on behalf of the Rockefeller Foundation and American Red Cross and announced that Dr. Richard P. Strong would be the American representative upon this executive committee.

Sir Ralph Paget, formerly British Minister to Serbia, was selected to represent the English societies on the Executive Committee and Dr. Jaubert was appointed as the French representative.

It was agreed that the committee should select its own chairman. It was also decided that Serbia should be divided into three sections, with each national group in charge of a section, but that the organization should be elastic so that changing conditions and emergencies might be met promptly, forces thrown into places where most needed, uniform methods and standards applied, and supplies equitably apportioned. Later a joint committee of English and Americans was formed in Paris to coöperate with the French authorities, and to help in buying and forwarding supplies to Serbia as required.

The agreement with the authorities controlling

the British and French medical units sent to Serbia, committing them to the principle of a central organization to direct the work in Serbia, was of the utmost importance. It gave marked impetus to Dr. Strong's efforts, upon his arrival in Serbia early in April, to secure for the various commissions absolute authority in sanitary matters throughout Serbia. With the aid and consent of the Serbian government and with the coöperation of the heads of the various Commissions, Dr. Strong succeeded in bringing about the organization of an International Serbian Sanitary Commission, consisting of the following persons:

OFFICERS:

President, H. R. H. The Crown Prince Alexander
Vice-President, Sir Ralph Paget
Medical Director, Dr. Richard P. Strong

MEMBERS:

The Chief Sanitary Officers of the Serbian Civil and
Military Departments.

A representative from the Serbian Parliament.

The Chiefs of the British, French, Russian and American
Sanitary Commissions.

The regulations decided upon by this Commission were immediately enforced through the Ministry of War and the Ministry of the Interior.

The following extracts from Dr. Strong's preliminary report describe the methods employed by the various medical units, working under the direction of the International Sanitary

Commission, to stamp out the epidemics which were ravaging Serbia.

"The country was divided, for sanitary purposes, into fourteen districts. To seven of these districts the French, British and Russian physicians were assigned and to the remaining seven the American physicians and sanitarians. A system for securing information regarding the occurrence of cases of typhus and other infectious diseases in each city and village throughout Serbia was established.

"House to house inspection for the finding of cases of typhus in the cities, with the removal of the patients to hospitals and wards devoted to the care of typhus cases, disinfection of such individuals, disinfection of the other inmates of houses in which cases of typhus had been discovered, as well as of their clothes, and finally disinfection of the houses themselves, were also systematically begun. Quarantine of individuals who had been in contact with typhus cases was undertaken after disinfection of their persons and clothing. In a number of such instances they were cared for in tents * * * where houses were not available as detention camps. In some instances the districts were so badly infected that it was necessary to evacuate them *en masse* and to destroy, by partially tearing down and by fire, the majority of the dwellings. Dispensaries were established in the different cities where the people were treated free of charge. These proved a great aid in the finding of infectious diseases.

"As typhus is conveyed from man to man commonly by vermin (the bite of the body louse), bathing and disinfection of very large numbers of people and immediate disinfection of their clothing in a short period of time was an important problem in combating the disease. For this purpose, sanitary trains consisting each of three converted railroad cars were fitted up. One car contained a huge boiler which supplied the steam for disinfection of the

clothing. In a second car fifteen shower baths were constructed. A third car was converted into a huge autoclave (disinfector), into which steam could be turned under atmospheric pressure. In this manner the vermin were immediately destroyed and the clothes thoroughly disinfected.

"Large tents were erected beside the railroad sidings on which the cars were placed. The people were marched by the thousands to these tents, their hair was clipped, and a limited number undressed themselves, carried their clothes to the disinfecting car and then passed to the car containing the shower baths. After a thorough scrubbing with soap and water they were sprayed with petroleum as an extra precaution for destroying the vermin. They then received their disinfected clothing. In many instances in which the clothing was very badly soiled fresh clothing was supplied.

"In the larger cities and in those situated away from the railway, disinfecting and bathing plants were established or constructed, and separate hours were arranged for bathing women and men in large numbers.

"In many towns the clothes were disinfected by baking them in ovens, either specially constructed for this purpose or those which had been built previously for the baking of bricks, or other purposes. As all the hospitals were infected it was necessary to systematically disinfect these and the inmates.

"The patients were first removed from a ward, which was then thoroughly disinfected. They were then given a thorough bath by being scrubbed with soap and water and disinfectants. They were given clean clothing and placed in the disinfected ward. Their old clothing was usually boiled. The wards were first disinfected by sulphur fumigation to kill the vermin. Beds were then removed and disinfected, mattresses, sheets, etc., being disinfected with steam or by boiling. Walls, ceilings and

floors were then scrubbed with solutions of bichloride of mercury or carbolic solutions. In many instances the interiors of hospitals were thoroughly whitewashed. Every precaution was taken to prevent infection among the personnel of the Commission. A campaign of education of the people by the issuing of popular circulars describing the disease, its methods of transmission and prevention, was undertaken.

"As cholera had occurred in places along the border between Serbia and Austria it was deemed advisable to perform vaccination against this disease, and so vaccination trains and parties were also established, which went about the country with the doctors and assistants, who inoculated thousands of people daily. Vaccination against cholera and typhoid fever was made compulsory in Serbia
***** So far, no cases of cholera have occurred in Serbia this year.

"The water supply of many of the towns was also greatly improved and artesian wells were bored in a number of instances where the water in the vicinity had been condemned as unsafe after it had been examined systematically in our laboratories. In fact, a systematic bacteriological examination of local water supplies was one of the tasks which was undertaken by our laboratories.

"An important problem in the reduction of the amount of typhoid fever and the prevention of cholera was the disposal of human excreta, and a large number of sanitary and flyproof latrines were constructed throughout the country, particularly about barracks, hospitals, etc. In many cases the cesspools became filled to overflowing and there was not a sufficient number of hydraulic pumps in Serbia to empty a quarter of them. The American Red Cross immediately supplied, upon my request, a large number of these pumps. The construction of filter beds for purification of sewage was also undertaken in a number of places, and the sanitary condition of some of the ceme-

teries, where from twenty to thirty people had been buried in numerous shallow pits and insufficiently covered with earth, was improved. The destruction of the breeding places of flies, in connection particularly with the spread of typhoid and cholera, and of mosquitoes, in connection with the spread of malaria in southern Serbia, was also undertaken."

In July, the members of the War Relief Commission spent some ten days in Serbia endeavoring to find out how much destitution existed among the civil population of Serbia and Montenegro, and to ascertain the general conditions as to health and sanitation in the two countries as the result of the three months of work by the International Sanitary Commission. Montenegro had been included in the territory covered by the Sanitary Commission shortly after Dr. Strong commenced active work in Serbia.

The Commission found that at that time the problem of destitution was to a very considerable extent, if not fully, being cared for by existing agencies.

It was quite evident to the members of the Commission from the moment of their arrival that the sanitary conditions were in vivid contrast to those described in their first report. There seemed to be not the slightest fear among the people of the possibility or danger of contracting a dangerous disease. The government officials and the doctors all felt that the typhus epidemic was practically at an end. A consider-

able amount of sanitary work in the way of cleaning up remained, however, to be done.

On August 12th the International Sanitary Commission officially declared the typhus epidemic to be at an end. Early in September Dr. Strong recommended that the staff of the American section be reduced to twelve men on October 1st, and that this staff be authorized to conduct general sanitary work in Serbia for six months from that date. The estimated cost of the work was \$30,000. Dr. Strong's recommendation was approved by the American Red Cross and the Rockefeller Foundation agreed to provide the amount needed to carry on the work for the period agreed upon. Accordingly, toward the end of September, the American Sanitary Commission, with the exception of the one unit authorized to continue sanitary work, brought its work to a close.

The Rockefeller Foundation contributed \$100,000 for work in Serbia. In the latter part of February, when the members of the War Relief Commission thought at first that money was needed chiefly to relieve destitution in Serbia, the Foundation, in response to their cabled request, placed \$25,000 to their credit abroad to be spent in Serbia for such purposes as they might think best. As has been previously described in this report, further investigation convinced them that the paramount problem in Serbia was the control of epidemics, and resulted

in their recommendation that a Sanitary Commission be sent to Serbia. Upon learning that the Foundation had granted their request for \$25,000 for Serbian relief, the members of the Commission gave \$5,000 to Dr. Barrie of the English Red Cross to be applied in properly equipping for hospital purposes a building at Skopje which had been turned over to him by the Government to be used as an isolation hospital. Later, when the American Sanitary Commission was organized, the War Relief Commission turned over to Dr. Strong the \$20,000 remaining at its disposal for Serbia. Subsequently amounts totaling \$75,000 were remitted to the American Red Cross by the Foundation, as contributions toward the expenses of the Sanitary Commission.

The sanitary work of the unit left in Serbia by Dr. Strong under the direction of Mr. Edward Stuart was abruptly interrupted early in October by the invasion of Serbia by the Central Powers. During October and November every effort was made to ascertain through Mr. Stuart and others the conditions in Serbia and among the refugees who had fled from the country. On November 30th cablegrams from Mr. Stuart and Dr. Henry S. Forbes reported an extreme lack of food and clothing among the general population at Monastir and recommended that flour and clothing be sent via Salonica. The Foundation immediately contributed \$5,000 to the American

Red Cross to be sent to Mr. Stuart for emergency relief work.

The question of providing food and clothing was taken up energetically by the American Red Cross and 400 tons of supplies costing \$50,000 were shipped on the steamer "Frixos," which left for Piræus on January 1st. The Foundation contributed \$30,000 toward the cost of these supplies.¹

During December numerous reports were received from various relief organizations describing terrible conditions in Serbia and among the refugees who had left the country. Every effort was made by these organizations to formulate a comprehensive plan for administering relief under the extremely difficult conditions then obtaining.

FRANCE

In November, 1914, and February, 1915, Mr. James, representing the War Relief Commission, visited France and acquainted himself with conditions in that country. Owing to the urgency of the needs of the non-combatant population in the other countries referred to in this report, and to the large amount of volunteer relief work being done by other agencies in France, it was thought advisable by

¹Owing to the exigencies of the military situation the effective distribution of this cargo was delayed and a considerable part of it eventually reached the interior of Serbia overland by way of Marseilles and Switzerland.

the Foundation not to undertake active relief operations in France at that time.

In the summary of war relief work undertaken by the Foundation during 1914, mention was made of an appropriation to enable Dr. Carrel to meet the urgent need for certain sera. Dr. Carrel was spending his vacation in France at the outbreak of the war. He immediately offered his services to the French Government. They were accepted and he was detailed to the military hospital at Lyons. The terrible condition of the wounded that came to the hospital at Lyons for treatment, convinced Dr. Carrel that his greatest usefulness would consist in a combination of research with military hospital service. To this end arrangements were made whereby he was provided with a military hospital at Compiègne near the front, with accessory pathological and chemical laboratories in which special facilities were offered for carrying out the surgical procedures in which Dr. Carrel was especially interested. Mr. James cabled to the Rockefeller Institute for Medical Research advising that the French Government had made this arrangement with Dr. Carrel and recommending that the Institute give Dr. Carrel \$2,500 for equipping laboratories and appropriate \$1,200 a month for six months for maintenance. The Rockefeller Institute appropriated the amount recommended by Mr. James. Subsequently the Foundation appropriated

\$20,000 to the Rockefeller Institute to cover the expenditures in connection with Dr. Carrel's work and certain other small items. In November the Foundation appropriated \$5,000 additional to the Rockefeller Institute to enable it to continue its support of Dr. Carrel's work. As a result of Dr. Carrel's work in collaboration with Dr. Henry D. Dakin significant contributions to the technique of treating infected wounds and of accelerating their recovery were made.

ARMENIAN AND SYRIAN RELIEF

As early as August, 1914, the distressing conditions existing throughout the Turkish Empire were brought to the attention of the Rockefeller Foundation. On December 14, 1914, the following gentlemen met at the office of the Foundation to make representations concerning the need of relief: Hon. Oscar S. Straus; Dr. Arthur J. Brown and Dr. Stanley White, of the Presbyterian Mission Board; Dr. E. L. Smith, of the American Board of Commissioners for Foreign Missions; Professor Richard J. H. Gottheil; Dr. John R. Mott, and Rabbi Stephen S. Wise.

Reports were cited as having come from the American Ambassador in Constantinople, from agents of the mission boards, and others, showing that great distress was beginning to prevail in different parts of the Turkish Empire on ac-

count of the commandeering of money and supplies for the support of military operations.

In May, 1915, a report from the Persian War Relief Fund stated that destitution was widespread among refugees in Northwestern Persia, and that the immediate pressing need was for funds with which to buy food.

These and similar reports accumulating from many different sources over a period of several months caused the Executive Committee to determine upon sending a member of the War Relief Commission to Turkey to make a first-hand investigation of the situation on behalf of the Foundation. Accordingly Mr. Jeremiah Smith, Jr., a member of the law firm of Fish, Richardson, Herrick & Neave, of Boston, was appointed a member of the Commission and departed for Turkey early in June. Mr. Smith did not reach Constantinople until July 4th, and his report was not forwarded to the Foundation until August 8th. In the meantime conditions in Northwestern Persia were becoming acute. On July 20th the Persian War Relief Fund reported that it had been able to secure for relief in Persia only \$40,000 of the \$100,000 that was thought to be necessary in order to give fairly adequate relief, and requested the Foundation to aid it to meet the emergency. The Executive Committee believed that the situation was one calling upon the Foundation to act with something less than that finality and detail of knowl-

edge which ordinarily would be desirable, and appropriated \$20,000 to the Persian War Relief Fund.

In August representatives of the American Board of Commissioners for Foreign Missions transmitted to the Foundation a very full report upon the conditions and needs of the Christians in Turkey. The report of the War Relief Commission was expected daily at that time and it seemed best to the Executive Committee not to make any substantial contribution for Turkish relief until it had been received. An appropriation of \$10,000 was made, however, with the understanding that it would be disbursed by representatives in Turkey of the American Board acting in coöperation with Ambassador Morgenthau.

The report of the War Relief Commission regarding conditions in Turkey was received toward the end of August. It verified substantially the reports received during the year from other sources, and recommended that any relief given should be in the form of money which should be placed for disbursement in the hands of the representatives of missionary boards in Turkey acting in coöperation with the American Embassy.

About October 1st, the American Ambassador in Constantinople sent, through the State Department, an appeal for additional funds for the relief of the Turkish Empire. In the opinion of

Ambassador Morgenthau a fund of \$100,000 was required to carry on effective measures of relief; and similar representations were made by the American Board of Commissioners for Foreign Missions. In the meantime, a national committee had been organized to receive subscriptions and the Department of State advised that contributions be made through that committee. After a consideration of the situation existing at that time the Executive Committee of the Foundation appropriated \$30,000 for Armenian relief.

A few weeks later the principal Turkish and Persian relief agencies united, the combined organization being called the American Committee for Armenian and Syrian Relief. In November this Committee reported that the need in Northwestern Persia had been greatly increased since the Foundation's contribution in July, owing to the arrival in that section of 25,000 to 35,000 Syrians who had fled from the mountains of Eastern Turkey down into the plains between Urumia and Tabriz. The Committee asked for a contribution of \$10,000 from the Foundation to be sent to Northwestern Persia, with a similar amount which had been raised by the Committee. The Executive Committee appropriated the amount requested.

The question of further contributions for Armenian relief was held in abeyance pending a survey of the whole field of war relief work and a

determination of the relative urgency of the need in the various areas where aid was required.

WORK AMONG PRISONERS OF WAR

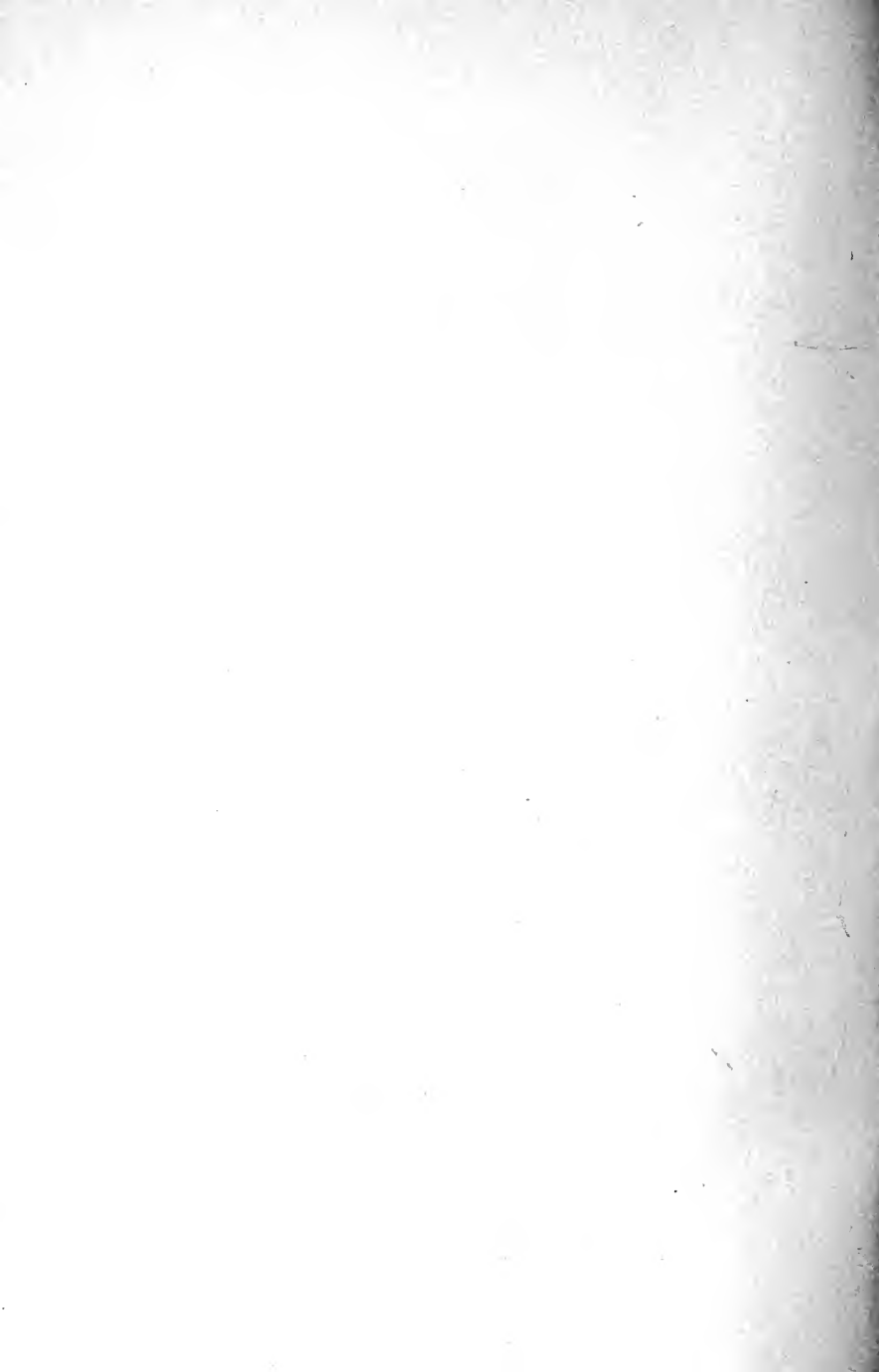
In June, Mr. John R. Mott of the International Committee of Young Men's Christian Associations brought to the attention of the Foundation the work which the Association had undertaken in the military prison camps throughout Europe. The method of work pursued by the Association was to erect buildings in as many as possible of these camps. The buildings had in them, as a rule, a large hall for lectures, meetings and entertainments and four or five smaller rooms for evening and day classes, as well as for library and committee purposes. After erecting a building in a camp, the Association organized a number of committees, the members of which were set to work interesting their comrades in the opportunities offered for study and recreation. The International Committee stated that it cost about \$2,000 to erect one of these buildings and run it for four months. An effort was being made to raise a fund of \$250,000 to take advantage of the opportunities for work open to the Committee. The Foundation was asked to contribute \$25,000 toward this fund, and this amount was appropriated by the Executive Committee.

HEADQUARTERS IN EUROPE

It became apparent during the year that in order to accomplish the objects of the War Relief Commission satisfactorily it should be continued indefinitely in Europe. This was desirable for the purpose both of keeping in touch with the rapidly changing phases of the relief work already in progress and of anticipating new needs. Accordingly, soon after the close of the year Mr. Warwick Greene, late Director of Public Works in the Philippine Islands, was appointed Director of the War Relief Commission, without limit of time, and his headquarters have been established at Berne.

The activities of the Commission have necessitated constant coöperation with the Department of State, with American diplomatic and consular officials abroad, with the representatives of many foreign governments, and with other relief agencies, as well as with a large number of private individuals, to all of whom grateful acknowledgments are due for unfailing courtesy and helpfulness.

WICKLIFFE ROSE,
Chairman.



THE ROCKEFELLER FOUNDATION

Report of the Treasurer

TREASURER'S REPORT

New York, January 15, 1916.

To the Members of The Rockefeller Foundation:

Gentlemen:

Herewith I send you a report of the financial operations of the Rockefeller Foundation and its subsidiary organizations for the fiscal year ending December 31, 1915.

The income for the year was \$4,183,084.19; the balance from the previous year, after adding sundry refunds, was \$4,468,103.99, making a total of \$8,651,188.18 available for disbursement. The sum of \$3,642,180.36 was disbursed, including \$1,341,561.11 on account of Mr. Rockefeller's designations, leaving a balance of \$5,009,007.82, divided as follows:

Amount to credit of Mr. Rockefeller's Reservation.....	\$1,443,334.24
Balance payable on appropriations	1,819,937.85
Amount available for appropriation	1,745,735.73

The two latter figures do not take into account pledges to unaffiliated organizations which will require payments in future years, amounting to \$744,800.00, as shown in Exhibit C, nor the Foundation's guarantee of Mr. Rockefeller's designation of \$1,452,125.11 for the Rockefeller Institute for Medical Research. The \$744,800.00 is treated as a current liability in the balance sheet, Exhibit A, thereby reducing the amount shown there as available for appropriation to \$985,935.73. The \$1,452,125.11, however, is not included in the balance sheet.

It should be noted that the income for the year does not include interest and dividends on bonds and stocks which had accrued on December 31, 1915, but which matured at later dates, while the accounts for previous year did include such accruals as of December 31. Because of this change, income for the year was reduced by about \$1,053,293.43.

The financial condition and operations of the Foundation are set forth in the following Exhibits:

Balance Sheet.....	Exhibit A
Receipts and Disbursements of General Funds Income.....	Exhibit B
Foundation Appropriations.....	Exhibit C
Mr. Rockefeller's Designations.....	Exhibit D
International Health Commission Disbursements.....	Exhibit E
China Medical Board Disbursements..	Exhibit F
China Medical Board Appropriations.	Exhibit G
War Relief Disbursements.....	Exhibit H
General Funds, Principal and Reserve.	Exhibit I
Land, Buildings and Equipment Fund.	Exhibit J
Funds Carried in Suspense.....	Exhibit K
Special Funds, Principal and Income..	Exhibit L
Transactions Relating to Invested Funds.....	Exhibit M
Schedule Showing Investment of General Funds.....	Exhibit N
Schedule Showing Investment of Special Funds.....	Exhibit O

Respectfully submitted,

L. G. MYERS,
Treasurer.

EXHIBIT A

BALANCE SHEET—

ASSETS

I. INVESTMENTS:

General (Exhibit N).....	\$104,929,729.94
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Less amount of income in- vestments (see below).....	3,605,153.16
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	<u>\$101,324,576.78</u>
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Special (Exhibit O).....	422,624.67
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	<u>\$101,747,201.45</u>
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Funds Uninvested—Estate of Laura S. Rockefeller (Ex- hibit L).....	4,548.33
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	<u>\$101,751,749.78</u>
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II. LAND, BUILDINGS, EQUIPMENT
AND INVENTORIES (Exhibit J)..

	<u>\$319,241.04</u>
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III. INCOME ACCOUNTS:

ACCOUNTS RECEIVABLE:

General Fund (Exhibit B)...	\$379.93
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CASH ON HAND:

General Funds (Exhibits B & K).....	1,525,517.28
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INCOME INVESTED TEMPORARILY (Exhibit N).....	3,605,153.16
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	<u>\$5,131,050.37</u>
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GRAND TOTAL.....	
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	<u><u>\$107,202,041.19</u></u>
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EXHIBIT A

DECEMBER 31, 1915

FUNDS AND OBLIGATIONS

I. FUNDS:

General Funds (Exhibit I).....	\$100,000,000.00	
Reserve (Exhibit I).....	1,324,576.78	
	<hr/>	\$101,324,576.78

Special Funds (Exhibit L):

Gift of John D. Rockefeller..	\$37,000.00	
Gift of Laura S. Rockefeller.	49,300.00	
Gift of Estate of Laura S. Rockefeller.....	340,873.00	
	<hr/>	427,173.00
		<hr/>
		\$101,751,749.78

II. LAND, BUILDINGS AND EQUIPMENT FUND:

Appropriations from Income (Exhibit J).....		\$319,241.04
		<hr/>

III. INCOME ACCOUNTS:

Income reserved for payment on account of Mr. Rockefeller's designations (Exhibit D)....	\$1,443,334.24	
Balance payable on appropria- tions (Exhibit C).....	1,834,937.85	
Installments of appropriations due in 1916 and subsequent years (Exhibit C).....	744,800.00	
Income available for appropria- tion.....	985,935.73	
Funds carried in suspense (Ex- hibit K).....	120,000.00	
Accounts payable—General Funds (Exhibit B).....	2,042.55	
	<hr/>	\$5,131,050.37
		<hr/>
		<hr/>
		\$107,202,041.19

NOTE. The foregoing obligations do not include the Foundation's guarantee of Mr. Rockefeller's designation of \$1,452,125.11 for the Rockefeller Institute for Medical Research.

EXHIBIT B

GENERAL FUNDS

RECEIPTS AND DISBURSEMENTS OF INCOME

RECEIPTS

BALANCE JANUARY 1, 1915:		
Undisbursed income..	\$4,443,992.84	
Special contribution...	\$500.00	
Less amount returned to donor.....	22.90	477.10
		<hr/>
		\$4,444,469.94
Refund of unexpended balances of 1914 ap- propriations to Inter- national Health Com- mission.....	\$19,727.05	
Deduct further payments on 1914 account....	1,093.00	
		<hr/>
		18,634.05
Amount appropriated for Dr. Carrel's work, re- funded by The Rocke- feller Institute.....		5,000.00
		<hr/>
TOTAL NET BALANCE.		\$4,468,103.99
Income received for the year, not including ac- crued income as of December 31, 1914, amounting to \$604,- 960.53, shown in 1914 account.....		4,183,084.19

\$8,651,188.18

EXHIBIT B

GENERAL FUNDS

RECEIPTS AND DISBURSEMENTS OF INCOME

DISBURSEMENTS

EQUIPMENT, ETC., PURCHASED AND CARRIED IN LAND, BUILDINGS AND EQUIPMENT FUND:	
Furniture and Fixtures.....	\$12,428.16
Library.....	325.55
Drugs, etc.....	11,341.28
Grand Chenier Tract—Taxes, fees, etc.....	6,259.34
	<hr/>
	\$30,354.33
ADMINISTRATION:	
Secretary's Office.....	\$54,724.89
Treasurer's Office.....	11,817.59
	<hr/>
	66,542.48
SUBSIDIARY ORGANIZATIONS:	
International Health Commission (Exhibit E).....	\$441,301.23
China Medical Board (Exhibit F)..	157,623.40
War Relief (Exhibit H).....	582,339.58
Department of Industrial Relations.	19,509.77
Scientific Studies of Governmental Problems.....	50,000.00
	<hr/>
	1,250,773.98
PAYMENTS MADE TO UNAFFILIATED ORGANIZATIONS ON ACCOUNT OF FOUNDATION APPROPRIATIONS (Ex- hibit C).....	
	952,948.46
PAYMENTS ON ACCOUNT OF MR. ROCKE- FELLER'S DESIGNATIONS (Exhibit D)	
	1,341,561.11
	<hr/>
TOTAL DISBURSEMENTS.....	\$3,642,180.36
BALANCE:	
Securities (Exhibit N).....	\$3,605,153.16
Accounts Receivable.....	379.93
Cash on Deposit.....	1,405,517.28
	<hr/>
	\$5,011,050.37
Less Accounts Payable.....	2,042.55
	<hr/>
	5,009,007.82

\$8,651,188.18

EXHIBIT C

Foundation Appropriations made in 1915, Unpaid Balances and Installments of Appropriations Made in Previous Years, and Payments Thereon Made in 1915

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1915	APPROPRI- ATED DUR- ING 1915	PAYMENTS DURING 1915
R.F. 265 Bureau of Municipal Research for constructive studies in the Government of New York, \$10,000.00 per year for five years (installment due in 1915).....	\$10,000.00	\$10,000.00
R.F. 266 Bureau of Municipal Research for its New York City work during the current year.	20,000.00	20,000.00
R.F. 268 Mayor's Committee on Unemployment of the City of New York.....	10,000.00	10,000.00
R.F. 285 Colorado State Committee on Unemployment and Relief....	100,000.00	99,984.59
R.F. 295 Bureau of Municipal Research for study of prison administration in the State of New York.....	2,000.00	.....
R.F. 2102 Bureau of Municipal Research for its New York City work, \$15,000.00 per year for four years, beginning with 1916.....
R.F. 2105 Academy of Political Science for enlarging the edition of proceedings of the meeting of the Academy on the Revision of the State Constitution.....	500.00	500.00
R.F. 2712 Bureau of Social Hygiene, toward the support of Diagnostic Laboratory maintained by the Department of Health of New York City	712.50	712.50
AMOUNTS CARRIED FORWARD.....	\$143,212.50	\$141,197.09

EXHIBIT C—Continued

AMOUNTS BROUGHT FORWARD.....	APPROPRI- ATED PRIOR TO 1915	APPROPRI- ATED DUR- ING 1915	PAYMENTS DURING 1915
		\$143,212.50	\$141,197.09
R.F. 2135 Rockefeller In- stitute for Medical Re- search for its Corporate Purposes, payment to be made on completion of the new buildings of the Institute at Princeton, New Jersey.....	.....	1,000,000.00	.....
R.F. 215 American Acad- emy in Rome for general purposes, \$10,000.00 a year for ten years (in- stallment due in 1915)..	\$10,000.00	.....	10,000.00
R.F. 228 Committee of Reference and Counsel of the Annual Foreign Missions Conference of North America for carry- ing out its program of co- operation and coördina- tion in foreign mission- ary work of the principal American Mission Boards, total pledge of \$425,000.00 extending over ten years (install- ment due in 1915).....	75,000.00	.....	75,000.00
R.F. 251 Bureau of Mu- nicipal Research for Studies in State Govern- ment.....	5,000.00	.....	3,775.00
R.F. 233 National Com- mittee for the Prevention of Blindness, \$5,000.00 a year for five years. In- stallments due in 1914 and 1915.....	10,000.00	.....	10,000.00
R.F. 234 Wellesley Col- lege, towards fund for buildings and endow- ment.....	750,000.00	.....	680,976.41
AMOUNTS CARRIED FOR- WARD.....	\$850,000.00	\$1,143,212.50	\$920,948.50

THE ROCKEFELLER FOUNDATION

EXHIBIT C—Continued

AMOUNTS BROUGHT FORWARD.....	APPROPRI- ATED PRIOR TO 1915	APPROPRI- ATED DURING 1915	PAYMENTS DURING 1915
R.F. 239 Association for Improving the Condition of the Poor, for the pur- pose of providing pen- sions for dependent wid- ows with families, \$20,- 000.00 a year for ten (10) years. Installment due in 1914	\$850,000.00	\$1,143,212.50	\$920,948.50
Installment due 1915....	20,000.00	.....	20,000.00
R.F. 262 and 2107 For Pro- motion of Mental Hygiene	20,000.00	.....	.....
		29,800.00	11,999.96
TOTALS TO UNAFFILIATED ORGANIZATIONS.....	\$890,000.00	\$1,173,012.50	\$952,948.46
TO ADMINISTRATION AND AFFILIATED ORGANIZATIONS:			
Administration of Rockefeller Founda- tion.....		\$66,554.20	\$66,542.48
To International Health Commission		800,112.89	441,301.23
To China Medical Board.....		451,683.60	157,623.40
To War Relief.....		612,339.58	582,339.58
To Industrial Relations.....		21,500.00	19,509.77
To Scientific Inquiry Governmental Problems.....		90,000.00	50,000.00
TOTALS FOR R.F. ADMINISTRATION AND AFFILIATED ORGANIZATIONS		\$2,042,190.27	\$1,317,316.46

SUMMARY

Balances and installments of appro- priations to unaffiliated organiza- tions made prior to 1915.....	\$890,000.00	
Appropriations made in 1915.....	1,173,012.50	
		\$2,063,012.50
Appropriations for R.F. Administra- tion and affiliated organizations made in 1915.....		2,042,190.27
TOTAL APPROPRIATIONS.....		\$4,105,202.77
Payments on account of appropria- tions to unaffiliated organizations.	\$952,948.46	
Payments on account of appropria- tions for R.F. Administration and affiliated organizations.....	1,317,316.46	
TOTAL PAYMENTS.....		2,270,264.92
BALANCE PAYABLE ON ALL AP- PROPRIATIONS.....		\$1,834,937.85

EXHIBIT C—Continued

In Addition to the Foregoing, Pledges to Unaffiliated Organizations Already Reported Will Require for Payments in Future Years the Following Amounts:

Year 1916.....	\$110,000.00
Year 1917.....	110,000.00
Year 1918.....	110,000.00
Year 1919.....	100,000.00
Year 1920.....	70,000.00
Year 1921.....	65,000.00
Year 1922.....	60,000.00
Year 1923.....	55,000.00
TOTAL, THE ROCKEFELLER FOUNDATION.....	\$680,000.00
TOTAL, CHINA MEDICAL BOARD PLEDGES TO UNAFFILIATED ORGANIZATIONS, AS SHOWN IN EXHIBIT G.....	64,800.00
	<u>\$744,800.00</u>

EXHIBIT D

MR. JOHN D. ROCKEFELLER'S DESIGNATIONS¹

PAYMENTS MADE TO UNAFFILIATED ORGANIZATIONS

Alta Social Settlement, toward the budget for the fiscal year, \$13,500; and toward the repair fund, \$1,000.....	\$14,500.00
American Baptist Home Mission Society.....	100,000.00
American Baptist Foreign Mission Society, toward the accumulated deficit in the missionary work of the Foreign Mission Society, Home Mission Society and Women's Foreign Mission Society of the East, \$50,000; and as a contribution toward the work of the fiscal year, \$200,000.....	250,000.00
American Female Guardian Society and Home for the Friendless.....	500.00
Baptist Church Extension Society of Brooklyn and Queens.....	3,000.00
Baptist Ministers' Home Society.....	250.00
Baptist Missionary Convention of the State of New York, toward the general work and also its church edifice fund.....	15,000.00
Baptist Union of Western Canada, toward their Baptist missionary work for the current fiscal year....	10,000.00
AMOUNT CARRIED FORWARD.....	<u>\$393,250.00</u>

¹By his letter of gift of March 6, 1914, Mr. Rockefeller reserved the right to draw from the income of the Foundation the sum of \$2,000,000 annually, to be applied during his lifetime to such specific objects within the corporate purposes of the Foundation as he might from time to time direct.

EXHIBIT D—Continued

AMOUNT BROUGHT FORWARD.....	\$393,250.00
Blue Ridge Association, toward a total of \$3,000, to meet expenses of maintaining the Social Service Summer School of the Association.....	1,500.00
Brooklyn Bureau of Charities.....	2,000.00
Boy Scouts of America.....	5,000.00
Charity Organization Society of the City of New York	6,000.00
Children's Aid Society.....	2,500.00
Clemson Agricultural College, toward the cost of erecting and equipping a building for the social and religious work of the students.....	50,000.00
Cleveland Federation for Charity and Philanthropy..	9,000.00
Cleveland School of Art.....	700.00
Committee on the Prevention of Tuberculosis, for the Red Cross Christmas Seal Fund.....	500.00
Eugenic Record Office, of Cold Spring Harbor, L. I., to provide for field workers in Eugenics in State institutions.....	4,050.00
Federal Council of Churches of Christ in America...	500.00
Foreign Mission Board of the Southern Baptist Convention, for the equipment of their work in foreign lands.....	49,811.63
Girls' Branch of the Public Schools Athletic League..	300.00
Hospital Saturday and Sunday Association.....	5,000.00
International Committee of Young Men's Christian Associations, toward its home work for the fiscal year, \$22,500; and to the foreign work, \$32,500....	55,000.00
International Y. M. C. A. College.....	2,000.00
Laymen's Missionary Movement, toward the current expenses of the present fiscal year, \$5,000; and for the expenses of the National Missionary Campaign for 1915-16, \$3,450.....	8,450.00
Legal Aid Society.....	1,000.00
Music School Settlement, as a special gift to meet the exigencies of the present year.....	1,500.00
National Association for the Study and Prevention of Tuberculosis.....	500.00
National Board of the Young Women's Christian Associations.....	10,000.00
National League on Urban Conditions Among Negroes	2,000.00
New Jersey Baptist Convention.....	900.00
New York Association for Improving the Condition of the Poor.....	7,000.00
New York City Baptist Mission Society, for the fiscal year, \$28,000; and for the Grace Church Building Fund, \$2,985.60.....	30,985.60
New York Milk Committee.....	4,000.00

AMOUNT CARRIED FORWARD..... \$653,447.23

TREASURER'S REPORT

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EXHIBIT D—Continued

AMOUNT BROUGHT FORWARD.....		\$653,447.23
Ohio Baptist Convention, for the General Fund and for the Church Edifice Fund.....		4,500.00
People's Institute.....		1,000.00
Prison Association of New York.....		500.00
Public Education Association.....		5,000.00
Rockefeller Institute for Medical Research, to be used for its corporate purposes.....		8,854.17
Rockefeller Institute for Medical Research, toward the construction of new buildings.....		570,559.71
Seamen's Church Institute of New York, toward the cost of their building.....		50,000.00
Society for Italian Immigrants.....		750.00
State Charities Aid Association of New York.....		2,000.00
State Executive Committee of the Young Men's Christian Association.....		1,000.00
State Mission Board of the Pennsylvania Baptist General Convention.....		800.00
Superintendent W. H. Maxwell, New York City Schools, toward a fund to provide cooking utensils for various schools, and food for destitute pupils...		2,500.00
Traveler's Aid Society, toward the work for the year 1914.....		1,000.00
Westchester County Poor, Special Agent, to work among the poor children.....		1,200.00
Westchester County Poor, Eugenic Investigator, to cover expenses for nine months.....		900.00
Working Women's Protective Union.....		50.00
Young Men's Christian Association:		
Brooklyn	\$1,000.00	
Cleveland	2,000.00	
Tarrytown.....	500.00	
University of Michigan, toward providing the necessary land, and erecting and equipping a building.....	30,000.00	
White Plains.....	5,000.00	38,500.00
		<hr/>
		\$1,342,561.11
Deduct refund on 1914 payment.....		1,000.00
		<hr/>
TOTAL PAYMENTS IN 1915.....		\$1,341,561.11
Balance subject to Mr. Rockefeller's Designation, January 1, 1915.....	\$784,895.35	
Set aside for Mr. Rockefeller's Des- ignation during 1915.....	2,000,000.00	2,784,895.35
		<hr/>
Balance subject to Mr. Rockefeller's Designation, January 1, 1916.....		<u>\$1,443,334.24</u>

EXHIBIT E INTERNATIONAL HEALTH COMMISSION

STATEMENT OF DISBURSEMENTS

ADMINISTRATION:

Home Office.....	\$48,934.18
Survey and Exhibits.....	8,565.65
Panama and Pacific Exhibition.....	6,492.00

\$63,991.83

PAYMENTS FROM HOME OFFICE FOR WORK

DONE IN FIELD.....

9,526.00

SOUTHERN STATES:

Alabama.....	\$4,343.33
Georgia.....	22,822.59
Kentucky.....	12,030.00
Louisiana.....	860.01
Mississippi.....	13,295.00
North Carolina.....	3,026.99
South Carolina.....	6,700.00
Tennessee.....	11,889.72
Texas.....	7,755.96
Virginia.....	6,961.16
County Dispensary Work.....	4,796.92

94,481.68

CENTRAL AMERICA:

Administration.....	\$1,617.37
Costa Rica.....	19,971.74
Guatemala.....	11,523.56
Nicaragua.....	15,033.25
Panama.....	19,783.86

67,929.78

WEST INDIES:

Administration.....	\$7,772.87
Antigua.....	5,571.80
British Guiana.....	15,935.10
Dutch Guiana.....	4,001.88
Grenada.....	10,751.96
St. Lucia.....	6,512.07
St. Vincent.....	5,347.50
Trinidad.....	14,451.67

70,344.85

THE EAST:

Administration.....	\$13,393.10
Ankylostomiasis Commission.....	15,927.65
Ceylon.....	2,245.00
Egypt.....	11,250.00
Philippine Hospital Ship.....	25,000.00
Seychelles Islands.....	1,157.33

68,973.08

ADVANCE REMITTANCES FOR WORK IN YEAR 1916.....

78,655.48

\$453,902.70

Deduct Credit on Account of Letters of Credit.....

12,601.47

\$441,301.23

EXHIBIT F CHINA MEDICAL BOARD

STATEMENT OF DISBURSEMENTS

PROPERTY PURCHASED AND CARRIED IN LAND, BUILDINGS AND EQUIPMENT FUND:	
Property of the Union Medical College.	\$39,895.12
Land of J. Ying.....	24,055.99
Equipment.....	48.65
	<hr/>
	\$63,999.76
ADMINISTRATION:	
Home Office.....	\$39,795.48
Peking Office.....	7,348.47
Union Medical College.....	14,905.14
	<hr/>
	62,049.09
PAYMENTS ON ACCOUNT OF APPROPRIATIONS TO UNAFFILIATED ORGANIZATIONS (EXHIBIT G).....	
	<hr/>
	33,903.37
	<hr/>
	\$159,952.22
Deduct Credit on Account of Letters of Credit.....	
	<hr/>
	2,328.82
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	<u>\$157,623.40</u>

EXHIBIT G

China Medical Board Appropriations and Payments From 1915 Income

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	AMOUNTS	
	APPROPRIATED	PAID
C.M. 27 Yale Foreign Missionary Society, to pay the cost of not to exceed six instructors for its Medical School at Changsha, China.....	\$16,200.00	\$6,605.90
C.M. 28 Harvard Medical School of China, for current expenses of fiscal year July 1, 1915, to June 30, 1916.....	15,000.00	15,000.00
C.M. 211 American Board of Commissioners for Foreign Missions, for salary and allowances of two doctors.....	3,236.00	600.00
C.M. 214 Board of Foreign Missions of the Presbyterian Church in the United States, for salary and allowance of two doctors and four nurses.....	17,200.00	.....
	<hr/>	<hr/>
AMOUNT CARRIED FORWARD.....	\$51 636.00	\$22,205.90

THE ROCKEFELLER FOUNDATION

EXHIBIT G—Continued

	AMOUNTS APPROPRIATED	AMOUNTS PAID
AMOUNT BROUGHT FORWARD.....	\$51,636.00	\$22,205.90
C.M. 215 Foreign Christian Missionary Society, for salary and allowances of one doctor and two nurses.....	4,600.00	.....
C.M. 220 Mr. Dilley, of the Union Medical College, for special graduate work in the United States.....	1,000.00	750.00
C.M. 221 Executive Committee of Foreign Missions of the Presbyterian Church in the United States, for salary and allowances of one doctor and two nurses.....	4,875.00	425.00
C.M. 222 Fellowships for Dr. and Mrs. Chiu.....	700.00	700.00
C.M. 29 Fellowship in Medicine (1)....	2,000.00	1,250.00
C.M. 223 Board of Foreign Missions of the Methodist Episcopal Church.....	11,800.00	.....
C.M. 210 Scholarships for Pharmacists (3) (no commitments have been made).	.....	.....
C.M. 218 Special Appropriation at the disposal of Dr. Buttrick.....	10,000.00	1,535.00
C.M. 21 Kuling Medical Missionary Association, for equipment of laboratory	1,000.00	.....
C.M. 22 Rockefeller Fellowship in Medicine (4).....	5,600.00	4,086.25
C.M. 23 Rockefeller Fellowship in Medicine (2).....	2,800.00	1,401.22
C.M. 26 Scholarships to Chinese Women (5). Commitments for two (2) only...	7,400.00	950.00
C.M. 24 Nurses' Association of China, for salary of translator of nursing textbooks.....	900.00	600.00
TOTAL TO UNAFFILIATED ORGANIZATIONS.....	\$104,311.00	\$33,903.37
TO AFFILIATED ORGANIZATIONS:		
Administration at home and in China..	59,072.60	*59,720.27
Equipment.....	.....	48.65
C.M. 212-13 Purchase of Union Medical College.....	213,300.00	39,895.12
C.M. 25 Purchase of Land from J. Ying.	25,000.00	24,055.99
C.M. 224 Discretionary Fund, to be used to purchase property.....	50,000.00	.....
	\$451,683.60	\$157,623.40
Balance payable on China Medical Board Appropriations.....		294,060.20
		\$451,683.60

* Net, after deducting unused letters of credit.

EXHIBIT G—Continued

China Medical Board pledges to Unaffiliated Organizations require for payment in future years the following amounts:

Year 1916.....	\$16,200.00
Year 1917.....	16,200.00
Year 1918.....	16,200.00
Year 1919.....	16,200.00
	<hr/>
	<u>\$64,800.00</u>

EXHIBIT H

STATEMENT OF DISBURSEMENTS FOR WAR RELIEF,
FOR THE YEAR 1915

WAR RELIEF COMMISSION:

Administration.....	\$31,757.10
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BELGIAN RELIEF:

Food Supply.....	\$2,839.54
Relief Work for Refugees in Holland..	78,410.94
Relief of University Professors in England.....	20,000.00
Commission for Relief in Belgium, for clothing.....	200,000.00
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	301,250.48

SERBIAN SANITATION AND RELIEF.....	104,332.00
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ARMENIAN AND SYRIAN RELIEF.....	70,000.00
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Advanced to American Red Cross for war relief, but not expended.....	25,000.00
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International Committee of Young Men's Christian Associations, for work in prison camps.....	25,000.00
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The Rockefeller Institute for Medical Re- search, for Medical Supplies and Re- search at the Seat of War.....	25,000.00
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\$582,339.58

EXHIBIT I

GENERAL FUNDS

PRINCIPAL FUND

Amount received May 22, 1913, from Messrs. John D. Rockefeller, Jr., Starr J. Murphy, Jerome D. Greene and Edward L. Ballard, Trustees, in securities.....	\$3,200,000.00
Mr. John D. Rockefeller's gift of June 14, 1913, in securities and accrued interest and dividends....	21,052,028.54
Mr. John D. Rockefeller's gift of June 27, 1913, in securities and accrued dividends.....	10,178,402.00
Mr. John D. Rockefeller's gift of March 6, 1914, in securities and accrued dividends.....	65,569,569.46
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TOTAL OF JOHN D. ROCKEFELLER'S GIFTS TO GENERAL FUNDS.....	\$100,000,000.00

RESERVE

Gains on Securities Sold and Redeemed 1913-14.....	\$320,079.73
Gains on Securities Sold and Redeemed 1915 (Exhibit M).....	1,004,497.05
	<hr/>
	1,324,576.78

The total of the General Funds is invested in the securities shown in Exhibit N.....	<u><u>\$101,324,576.78</u></u>
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EXHIBIT J

LAND, BUILDINGS AND EQUIPMENT FUND

Income appropriated in 1914.....	\$224,886.95	
Income appropriated in 1915 (Exhibits B and F).....	94,354.09	
	<u> </u>	\$319,241.04

ASSETS ACQUIRED THROUGH
APPROPRIATION OF IN-
COME BY ROCKEFEL-
LER FOUNDATION:

Grand Chenier Tract (land, taxes, fees, etc.), in Louisiana.....	\$231,146.29	
Furniture and Fixtures.	12,428.16	
Library.....	325.55	
Inventory, Drugs, etc...	11,341.28	
	<u> </u>	\$255,241.28

BY CHINA MEDICAL BOARD:

On account Peking Union Medical College prop- erty, Peking, China...	\$39,895.12	
Land of J. Ying, Peking, China.....	24,055.99	
Equipment, New York City.....	48.65	
	<u> </u>	63,999.76
	<u> </u>	<u> </u>
	<u> </u>	<u>\$319,241.04</u>
		<u>\$319,241.04</u>

EXHIBIT K

FUNDS CARRIED IN SUSPENSE

Amount carried forward from previous year.....	\$80,000.00	
Proceeds of sale of coupons due July 1, 1915, removed from \$2,000,000 St. Louis and San Francisco Refund- ing 4% bonds.....	40,000.00	
	<u> </u>	
TOTAL AMOUNT ON DEPOSIT.....	<u> </u>	<u>\$120,000.00</u>

THE ROCKEFELLER FOUNDATION

EXHIBIT L
SPECIAL FUNDS

SPECIAL FUNDS OF LAURA S. ROCKEFELLER

Gift of June 7, 1913. (Income payable at Foundation's discretion to the Baptist Ministers' Home Society of New York).....	\$8,000.00
Gift of September 11, 1913. (Income payable at Foundation's discretion to the Baptist Home of Northern Ohio).....	8,000.00
Gift of November 29, 1913. (Income payable at Foundation's discretion to the Euclid Avenue Baptist Church, Cleveland, Ohio).....	24,000.00
Gift of December 9, 1913. (Income payable to the Baptist Home Society of the City of New York)....	9,300.00
Investments as shown in Exhibit O.....	<u>\$49,300.00</u>

INCOME ACCOUNT

Interest on above gifts for the year 1915.	\$3,250.00
Amount sent to the various Societies as above.....	\$3,166.67
Interest accrued at date of gift repaid to Mrs. Rockefeller.....	83.33
	<u>\$3,250.00</u>

SPECIAL FUND OF ESTATE OF LAURA S. ROCKEFELLER

Received from the administrator in securities and accrued interest.....	\$340,873.00
Investments as shown in Exhibit O....	\$336,324.67
Accounts receivable.....	46.85
Cash on deposit.....	4,501.48
	<u>\$340,873.00</u>
	<u>\$340,873.00</u>

SPECIAL FUND OF JOHN D. ROCKEFELLER

Gift of December 15, 1914. (Income payable at Foundation's discretion to the Baptist Home for the Aged of New York City).....	\$25,000.00
Gift of February 11, 1915. (Income payable at Foundation's discretion to the Baptist Home for the Aged of New York City).....	12,000.00
Investments as shown in Exhibit O.....	<u>\$37,000.00</u>

INCOME ACCOUNT

Income received on above during 1915.....	\$1,850.00
Interest accrued at date of gift repaid to Mr. Rockefeller.....	\$485.42
Baptist Home for the Aged of New York City.....	1,364.58
	<u>\$1,850.00</u>

EXHIBIT M

Following is a Statement of Various Transactions Relating to Invested Funds, Together with Tables of Purchases, Sales and Exchanges of Securities:

On January 8, 1915, the Finance Committee authorized the exchange of \$500,000.00 Chicago, Milwaukee & St. Paul Railway Co. Debenture 4s, costing 91.0625%, for \$500,000.00 Refunding 4½s of the same Company at 89. The apparent loss on the Debenture bonds has been added to the cost of the Refunding bonds, which are secured in the same manner as the others and return a higher interest yield. In the tables of purchases and sales, in this Exhibit, the sale price of the one and the purchase price of the other are given as 91.0625%.

On February 1st, the International Mercantile Marine Co. failed to meet the interest payment due on that date on its issue of International Navigation Co. 5% bonds. The Company had already defaulted on its 4½% bonds, and in April, at the request of the Trustee of the latter mortgage, a Receiver was appointed. The Foundation owns \$1,305,000.00 of the Navigation Co. 5s and \$3,692,000.00 of the Marine Co. 4½s. The income thereon, amounting to \$231,390.00, has, of course, been cut off. A reorganization will be effected by Protective Committees representing both issues, or by the Committees representing the preferred and common stocks of the Company. The business of the Company has been so large and profitable during the last eight months that it is probable that the reorganization will provide for the payment of both issues of bonds.

During February, the \$10,000.00 Colorado Industrial Co. First Mortgage 5% bonds, carried at 80% in the Laura S. Rockefeller Fund for the Baptist Home Society of the City of New York, were exchanged, at the suggestion of the donor, for \$10,000.00 Virginia-Carolina Chemical Co. First Mortgage 5s at 93%. This transaction increases the principal fund by \$1,300.00. It is also shown in the table of securities bought, in this Exhibit.

On February 15, 1915, Mr. John D. Rockefeller conveyed to the Foundation \$12,000.00 par value Canada Southern Railway Consolidated Mortgage 5% bonds, the income of which is to be paid to the Baptist Home for the Aged, of New York City, as long as the Foundation shall deem it wise. This is the second gift from Mr. Rockefeller for this object, making \$37,000.00 of this issue of bonds in all.

The Consolidated Gas Company Convertible 6% bonds, referred to in the table of securities bought, in this Exhibit, were purchased from the Company, which issued the privilege to stockholders to subscribe at par in the proportion of \$1,000.00 in bonds to \$4,000.00 in stock. As the value of this privilege represented 10% of the par value of the bonds (equal to 2½% of the par value of the stock), and as the exercise of the privilege left the market value of the stock impaired to that extent, the Finance Committee ruled that the bonds should be given a valuation of 110%, and the original valuation of the stock reduced by 2½%.

On March 1st, the Western Pacific Railway Company failed to

EXHIBIT M—Continued

meet the interest due on its First Mortgage 5% bonds, of which the Foundation holds \$4,039,000, thus curtailing income by \$201,950.00 a year. A Protective Committee has been formed, of which Mr. Starr J. Murphy is a member. The bonds have been deposited with the Equitable Trust Co. as Depositary under an agreement dated May 1, 1915.

As stated in the table of securities sold and redeemed, in this Exhibit, the Foundation has received from the Cleveland Trust Co. \$123,868.00 on account of the Foundation's interest in the assets of the Euclid Heights Realty Co., in liquidation, as represented by its ownership of \$716,000.00 of the bonds of the Company. This payment, with those previously received, exceeds the valuation at which the bonds were taken by \$121,870.28, which sum has been credited to Reserve. A further small distribution may be received later. The \$76,148.00 in mortgages on Euclid Heights property in Cleveland, reported in the table of securities bought, in this Exhibit, were received in part payment of the above.

On July 1, 1915, the Sunday Creek Company defaulted on its Collateral Trust 5% bonds, of which the Foundation holds \$81,000.00, thus curtailing income by \$4,050.00 a year.

On July 1st, the Protective Committee for the St. Louis & San Francisco Refunding 4s purchased the July 1, 1915, coupons of the \$2,000,000.00 par value of these bonds held by the Foundation. The \$40,000.00 received therefrom has been added to the suspense account in which the proceeds of the sales of July, 1914, and the January, 1915, coupons were placed, pending the readjustment of the Company's finances.

On September 1st, the Missouri Pacific Ry. Company defaulted on its 40-year Collateral 4% bonds, of which the Foundation holds \$2,198,000.00 par value, thus curtailing income by \$87,920.00 a year. These Bonds have been deposited with the Bankers Trust Co. as Depositary under a Reorganization Plan dated July 1, 1915, which provides for the exchange of this issue for 5% Preferred Stock of the reorganized company.

As of September 30th last, the Executors of the Estate of Mrs. Laura S. Rockefeller delivered to the Foundation securities having a value of \$340,324.67, and accrued dividends amounting to \$548.33, a total of \$340,873.00. The securities are listed in Exhibit O.

The Foundation has the following securities among its investments:

451 Shares H. B. Claffin Company Common at	79.32	\$35,774.92
354 Shares Pope Manufacturing Co. Common		
at.....	4.	1,416.00
280 Shares Pope Manufacturing Co. Preferred		
at.....	15.	4,200.00

Both of these companies have been in process of liquidation for a year or more, and it now appears that their assets are not sufficient to cover the claims of their creditors. The shares, therefore, have no apparent value, and, by order of the Finance Committee, the valuations at which they were taken have been charged against Reserve. They will hereafter be carried in the accounts without value, and will not appear in the Treasurer's reports.

EXHIBIT M—Continued

GENERAL FUNDS

SECURITIES SOLD AND REDEEMED

	PER CENT		LOSS	GAIN
500 Canadian Pacific Ry. 1st Debenture 5s.....	@96.	\$2,400.00		
500,000 Chicago, Milwaukee & St. Paul Debenture 4s	91.0625	455,312.50	\$150.00	
278,548 Euclid Heights property mortgages, payments received thereon.....		147,524.78		
716,000 Euclid Heights Realty Bonds, amount received in liquidation thereof.....		123,868.00		\$121,870.28
60,000 Magnolia Petroleum Co. 6s.....	100.	60,000.00		
36,000 New York Central Lines Equipment Trust 5s	100.	36,000.00		345.85
14,000 New York City Corporate Stock 6s.....	100.	14,000.00		
40,000 Provident Loan Society Certificates of Contribution.....	100.	40,000.00		
600 Shares Cuban-American Sugar, Preferred...	100.856	60,513.60		8,823.50
15,300 Shares Erie R.R. 1st Preferred.....	55.3015	846,113.00		142,313.00
16,603 Shares International Mercantile Marine, Common.....	1.5246	25,313.16	24,495.84	
5,832 Shares International Mercantile Marine, Preferred.....	5.979	34,869.53	29,282.06	
400 Shares International Paper Co., Common...	10.835	4,334.00		1,134.00
3,000 Shares International Agricultural, Common.	26.1412	78,423.50		63,423.50
4,000 Shares International Agricultural, Preferred.	60.787	243,146.32		123,146.32
2,000 Shares Missouri Pacific.....	11.1975	22,395.00	29,605.00	
43,600 Shares National Lead, Common.....	63.979	2,789,492.40		609,492.40
AMOUNTS CARRIED FORWARD.....		\$4,983,705.79	\$83,532.90	\$1,070,548.85

EXHIBIT M—Continued

GENERAL FUNDS

SECURITIES SOLD AND REDEEMED

	PER CENT	LOSS	GAIN
AMOUNTS BROUGHT FORWARD.....			
6,000 Shares St. Louis & San Francisco, 2nd Preferred.....	5.789	\$83,532.90	\$1,070,548.85
388 Shares Swan & Finch, Capital.....	127.511	7,265.00	
8,100 Shares U. S. Cast Iron Pipe, Common.....	19.4016	28,125.67	76,153.00
3,000 Shares U. S. Cast Iron Pipe, Preferred.....	50.481		18,109.69
Total amount received from Securities Sold and Redeemed.....			
Gross Gain on Securities Sold and Redeemed		\$5,376,511.14	\$1,164,811.54
Gross Loss on Securities Sold and Redeemed		\$118,923.57	
SECURITIES WRITTEN OFF:			
451 Shares H. B. Clafin Co., Common.....		35,774.92	
354 Shares Pope Manufacturing Co., Common..		1,416.00	
280 Shares Pope Manufacturing Co., Preferred..		4,200.00	
TOTAL LOSS.....			160,314.49
NET GAIN FOR YEAR CREDITED TO RESERVE.			\$1,004,497.05

SECURITIES BOUGHT

\$600,000 Anglo-French External Loan 5s.....	@96.25	\$577,500.00
500,000 Atlantic Coast Line 1st Consol. Mtg. 4s.....	91.	455,000.00
650,000 Baltimore & Ohio R.R. Co. Rfdg. & Gen. Mtg. 5s.....	99.75	648,375.00

350,000	Chicago, Milwaukee & St. Paul 25-yr. Deb. 4s.....	87.49	306,215.00
500,000	Chicago, Milwaukee & St. Paul Rfdg. 4½s.....	91.0625	455,312.50
500,000	Consolidated Gas Co. Conv. Deb. 6s.....	110.	550,000.00
76,148	Euclid Heights Property in Cleveland, Mortgages on.....	100.	76,148.00
330,000	New York Central & Hudson River 30-yr. Deb. 4s.....	88.45	291,885.00
250,000	Northern Pacific General Lien 3s.....	65.	162,500.00
1,500,000	Pennsylvania R.R. General Mtg. 4½s.....	98.25	1,473,750.00
40,000	Provident Loan Society, Certificate of Contribution.....	100.	40,000.00
500,000	Province of Quebec 5-yr. 5s.....	99.75	498,750.00
100,000	Southern Pacific Refunding 4s.....	86.	86,000.00
250,000	Union Pacific 1st Lien & Rfdg. 4s.....	90.125	225,312.50
5,000	Shares Atchison, Topeka & Santa Fe Pfd.....	98.25	491,250.00
TOTAL.....			<u>\$6,337,998.00</u>

SPECIAL FUNDS

ESTATE OF LAURA S. ROCKEFELLER

SECURITIES REDEEMED

\$4,000	Pennsylvania R.R. Conv. of 1905.....	100.	\$4,000.00
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LAURA S. ROCKEFELLER SPECIAL FUNDS

SECURITIES DELIVERED

10,000	Colorado Industrial Co. 1st 5%.....	80.	8,000.00
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SECURITIES RECEIVED

10,000	Virginia Carolina Chemical Co. 5%.....	93.	9,300.00
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EXHIBIT N

Schedule of Securities of The Rockefeller Foundation on December 31, 1915, Representing
Both Principal and Income Temporarily Invested

BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
American Agricultural Chemical 1st Mtg. Conv...	5	Oct. 1928	\$500,000	101.	\$505,000.00
Anglo-French External Loan.....	5	Oct. 1920	600,000	96.25	577,500.00
Ashland Power Company 1st Mtg.....	5	Mar. 1928	8,000	100.	8,000.00
Atlantic & Birmingham Ry. 1st Mtg.....	5	Jan. 1934	677,000	90.	609,300.00
Atlantic Coast Line Ry. 1st Consol. Mtg.....	4	July 1952	500,000	91.	455,000.00
Baltimore & Ohio R.R. Rfdg. & Gen. Mtg.....	5	Dec. 1995	650,000	99.75	648,375.00
Baltimore & Ohio R.R. 1st Mtg.....	4	July 1948	6,000	91.	5,460.00
Central Pacific Ry. 30-yr. Gtd. by So. Pac.....	3½	Aug. 1929	2,000	89.	1,780.00
Chicago & Alton R.R. Refunding.....	3	Oct. 1949	551,000	65.	358,150.00
Chicago & Alton Ry. 1st Mtg. Lien.....	4½	July 1950	854,000	53.	452,620.00
Chicago City & Connecting Rys. Coll. Trust.....	3	Jan. 1927	1,305,000	85.	1,109,250.00
Chicago, Burlington & Quincy R.R. Gen. Mtg.....	5	Mar. 1958	1,000,000	93.5	935,000.00
Chicago & Eastern Ill. R.R. Refdg. & Imp.....	4	July 1955	300,000	63.	189,000.00
Chicago, Milwaukee & St. Paul Ry. Gen. Mtg. Ser. A.....	4	May 1989	30,000	97.	29,100.00
Chicago, Milwaukee & St. Paul Ry. Gen. Mtg. Ser. C.....	4½	May 1989	500,000	103.	515,000.00
Chicago, Milwaukee & St. Paul Ry. Debenture...	4	July 1934	450,000	88.2838	397,277.50
Chicago, Milwaukee & St. Paul Ry. Gen. & Refdg. Ser. A.....	4½	Jan. 2014	500,000	91.0625	455,312.50
Chicago & North Western Railway Extension...	4	Aug. 15'26	50,000	95.	47,500.00
Chicago & North Western Railway Skg. Fund De- benture.....	5	May 1933	80,000	102.	81,600.00
Chicago Railways Co. 1st Mtg.....	5	Feb. 1927	500,000	97.	485,000.00
Cleveland, Cin., Chic. & St. Louis Ry., St. Louis Div. Coll. Tr.....	4	Nov. 1990	73,000	90.	65,700.00

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Cleveland, Cincinnati, Chicago & St. Louis Ry. Gen. Mtg.....	4	June 1993	700,000	83.89	587,250.00
Cleveland Short Line 1st Mtg. Gtd. L. S. & M. S.	4½	April 1961	500,000	95.	475,000.00
Cleveland Trust Co. Participation Ctf. in certain mortgages on property formerly owned by Euclid Heights Realty Co.....	•	.....	278,548	Liq. to	126,993.22
Colorado Industrial Co. 1st.....	5	Aug. 1934	2,000,000	80.	1,600,000.00
Consolidated Gas Co. (N. Y.) Conv. Debenture...	6	Feb. 1920	500,000	110.	550,000.00
Denver & Rio Grande R.R. 1st Consol.....	4	Jan. 1936	6,000	85.	5,100.00
Erie R.R. Conv. Ser. B.....	4	April 1953	1,065,000	75.	798,750.00
Illinois Central R.R. Refunding.....	4	Nov. 1955	300,000	87.	261,000.00
Interborough Rapid Transit 1st.....	5	Jan. 1966	1,000,000	96.	960,000.00
International Mercantile Marine Mtg. & Coll. Tr. Gold.....	4½	Oct. 1922	3,692,000	55.	2,030,600.00
International Navigation Co. 1st Skg. Fund.....	5	Feb. 1929	1,305,000	75.	978,750.00
Lake Erie & Western R.R. 2nd Mtg.....	5	July 1941	100,000	100.	100,000.00
Lake Shore & Mich. So. Ry. 1st Mtg.....	3½	June 1997	926,000	87.	805,620.00
Lake Shore & Mich. So. Ry. Debenture.....	4	Sept. 1928	762,000	92.	701,040.00
Lake Shore & Mich. So. Ry. Debenture.....	4	May 1931	2,673,000	92.	2,459,160.00
Long Island R.R. Refunding.....	4	Mar. 1949	2,000	90.	1,800.00
Louisville & Nashville R.R. Unified.....	4	July 1940	6,000	90.	5,580.00
Magnolia Petroleum Company 1st.....	6	Jan. 1937	3,140,000	100.	3,140,000.00
Missouri, Kansas & Texas Ry. Gen. Skg. Fund....	4½	Jan. 1936	1,325,000	84.	1,113,000.00
Missouri Pacific Ry. 40-year Collateral.....	4	Mar. 1945	2,198,000	60.	1,318,800.00
Morris & Essex R.R. 1st Mtg. & Refunding.....	3½	Dec. 2000	175,000	82.75	144,812.50
Mutual Fuel Gas Co. 1st Mtg.....	5	Nov. 1947	250,000	100.	250,000.00
N. Y. Central Lines Equip. Tr. of 1913.....	4½	36 M ea. yr. Jan. 17-'28	432,000	99.039	427,849.81
N. Y. Central & H. R. R. R. 30-year Debenture....	4	May 1934	330,000	88.45	291,885.00
New York City Corporate Stock.....	4¼	Mar. 1964	100,000	94.5	94,500.00
New York City 2-year Revenue Bonds.....	6	Sept. 1916	67,000	100.	67,000.00
New York City 3-year Revenue Bonds.....	6	Sept. 1917	94,000	100.	94,000.00
New York, Chicago & St. Louis R.R. 1st Mtg....	4	Oct. 1937	35,000	95.	33,250.00
New York, Chicago & St. Louis R.R. Debenture...	4	May 1931	1,303,000	87.	1,133,610.00
New York Connecting R.R. 1st Mtg.....	4½	Aug. 1953	250,000	93.38146	233,453.65

EXHIBIT N—Continued
BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
Norfolk & Western R.R. 1st Consol. Mtg.....	4	Oct. 1996	\$5,500	91.	\$5,005.00
Northern Pacific Ry. General Lien.....	3	Jan. 2047	250,000	65.	162,500.00
Northern Pacific Ry. Refunding & Imp.....	4½	July 2047	390,000	91.5769	357,150.00
Northern Pacific Ry. Prior Lien Ry. and Land Grant.....	4	Jan. 1997	5,500	93.	5,115.00
Ohio Fuel Supply Co. Debenture.....	6	Mar. 1927	51,925	100.	51,925.00
Pennsylvania R.R. Consolidated.....	4	May 1943	£2,400	99.	11,880.00
Pennsylvania R.R. General Mtg.....	4½	June 1965	\$1,500,000	98.25	1,473,750.00
Pere Marquette R.R. Consol.....	4	Jan. 1951	520,000	63.	327,600.00
Philadelphia Co. Convertible Debenture.....	5	May 1922	1,000,000	97.	970,000.00
Philadelphia Co. Gold Convertible.....	5	Aug. 1919	500,000	95.	475,000.00
Pittsburgh, Cin., Chic. & St. L. Ry. Con. Ser. D...	4	Nov. 1945	56,000	97.	54,320.00
Pittsburgh, Cin., Chic. & St. L. Ry. Con. Ser. I....	4½	Aug. 1963	500,000	103.	515,000.00
Province of Quebec, 5 year.....	5	April 1920	500,000	99.75	498,750.00
Rutland R.R. 1st Consolidated.....	4½	July 1941	25,000	81.	22,500.00
St. Louis & San Francisco R.R. Refunding.....	4	July 1951	2,000,000	76.	1,520,000.00
St. Louis & San Francisco, New Orleans, Texas & Mexico 1st.....	5	Mar. 1940	450,000	60.	270,000.00
Seaboard Air Line Ry. Adjustment.....	5	Oct. 1949	455,000	77.	350,350.00
Southern Pacific Branch Ry. 1st Mtg.....	6	April 1937	100,000	117.1402	117,140.20
Southern Pacific R.R. 1st Refunding.....	4	Jan. 1955	100,000	86.	86,000.00
Sunday Creek Co. Coll. Trust.....	5	July 1944	81,000	78.	63,180.00
Union Pacific R.R. 1st Lien & Refunding.....	4	Jan. 2008	250,000	90.125	225,312.50
Wabash R.R. 2nd Mortgage.....	5	Feb. 1939	117,000	98.	114,660.00
Wabash R.R. Detroit & Ohio Ext. 1st.....	5	July 1941	3,000	106.	3,180.00
Wabash R.R. Omaha Division 1st.....	3½	Oct. 1941	45,000	65.	29,250.00
Washington Railway & Electric Cons. Mtg. Gold.	4	Dec. 1951	450,000	83.5	375,750.00
Western Maryland R. R. 1st.....	4	Oct. 1952	1,032,000	78.9193	814,158.76
Western Pacific Ry. 1st.....	5	Sept. 1933	4,039,000	69.	2,786,910.00
Wheeling & Lake Erie R.R., Lake Erie Div. 1st...	5	Oct. 1926	140,000	100.	140,000.00
Wheeling & Lake Erie R.R. 1st Consol.....	4	Mar. 1949	434,000	80.	347,200.00
TOTAL BONDS.....					\$40,893,315.64

EXHIBIT N—Continued
STOCKS

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
OIL COMPANY STOCKS:				
Borne-Scrymser Company.....	20	350	295.	\$103,250.00
Buckeye Pipe Line Company (par \$50).....	16	49,693	160.	7,950,880.00
Cheebrough Manufacturing Co. Consolidated.....	40	690	670.	462,300.00
The Colonial Oil Company.....	..	619	100.	61,900.00
The Continental Oil Company.....	12	7,000	190.	1,330,000.00
Crescent Pipe Line Company (par \$50).....	6	14,120	60.	847,200.00
Cumberland Pipe Line Company.....	5	2,481	72.	178,632.00
Eureka Pipe Line Company.....	24	12,357	361.33	4,464,995.59
Galena Signal Oil Co. Preferred.....	8	4,193	140.	587,024.13
Galena Signal Oil Co. Common.....	12	20,842	190.	3,959,976.12
Indiana Pipe Line Co. (par \$50).....	16	24,845	125.111	3,108,385.28
National Transit Co. (par \$25).....	8	126,481	41.	5,185,721.00
New York Transit Co.....	16	12,392	300.	3,717,600.00
Northern Pipe Line Company.....	10	9,000	110.	990,000.00
Solar Refining Company.....	10	4,964	185.007	918,375.00
Southern Pipe Line Company.....	24	24,845	229.5556	5,703,308.88
Standard Oil Company (Kansas).....	12	4,966	275.016	1,365,733.13
Standard Oil Company (Kentucky).....	16	7,434	140.509	1,044,547.23
Standard Oil Company (Nebraska).....	20	2,482	270.	670,140.00
Standard Oil Company (Ohio).....	24	8,696	420.	3,652,320.00
South West Penn. Pipe Lines.....	12	8,000	160.	1,280,000.00
Swan & Finch Company.....	..	515	200.	103,000.00
Union Tank Line Company.....	5	24,105	70.	1,687,350.00
Washington Oil Company (par \$10).....	..	1,774*	30.	53,220.00
TOTAL OIL COMPANY STOCKS.....				\$49,425,858.36

EXHIBIT N—Continued
STOCKS

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
MISCELLANEOUS STOCKS:				
American Shipbuilding Co. Preferred.....	..	9,457	85.	\$803,845.00
American Shipbuilding Co. Common.....	..	14,972	35.	524,020.00
Atchison, Topeka & Santa Fe Ry. Common.....	6	21,100	95.95	2,009,908.33
Atchison, Topeka & Santa Fe Ry. Preferred.....	5	5,000	98.25	491,250.00
Central National Bank of Cleveland.....	8	500	159.22	79,611.10
Chehalis & Pacific Land Company.....	..	220	45.45	10,000.00
Chicago City & Connecting Ry. Preferred Participation Certificates.....	1½	17,530	69.1875	1,212,856.88
Chicago City & Connecting Ry. Common Participation Certificates.....	..	10,518	30.	315,540.00
Cleveland Arcade Company.....	8	2,500	98.6222	246,555.56
Cleveland Steel Company.....	..	2,121	100.	212,100.00
Cleveland Trust Company.....	10	286	238.195	68,123.77
Colorado & Southern Ry. Company 1st Preferred.....	..	7,000	54.	378,000.00
Consolidated Gas Company (of N. Y.).....	6	20,000	127.50	2,550,000.00
Wm. Cramp & Sons, Ship & Engine Building Co.....	..	648	15.	9,720.00
Erie Railroad Company 1st Preferred.....	..	21,100	46.	984,400.00
Great Lakes Towing Company Common.....	..	1,200	12.	14,400.00
Great Lakes Towing Company Preferred.....	7	1,527	88.7361	135,500.05
Great Northern Ry. Preferred.....	7	500	106.05	53,025.00
International Agricultural Corp. Preferred.....	..	7,345	30.	220,350.00
International Agricultural Corp. Common.....	..	9,575	5.	47,875.00
H. H. Kohlsaat Company.....	..	1,900	50.	95,000.00
Manhattan Railway Company.....	7	10,000	128.775	1,287,750.00
National Lead Company Preferred.....	7	1,400	104.	145,600.00

National Lead Company Common.....	3	29,900	50.	1,495,000.00
New York, Chicago & St. Louis R.R. Common.....	..	100	55.	5,500.00
New York, Chicago & St. Louis R.R. 2nd Preferred....	..	400	78.70	31,480.00
Northern Pacific Railway Company.....	..	1,000	91.7625	91,762.50
Ohio Fuel Supply Company (par \$25).....	8	4,154	41.	170,314.00
Otis Steel Company Preferred.....	7	140	90.	12,600.00
Otis Steel Company Common.....	..	329	20.	6,580.00
Pressed Steel Car Company, Preferred.....	7	500	89.75	44,875.00
Provident Loan Society Certificates (par \$5,000).....	6	40	100.	200,000.00
Seaboard Air Line Ry. Preferred.....	..	4,300	54.	232,200.00
Seaboard Air Line Ry. Common.....	..	3,400	21.	71,400.00
Superior Savings & Trust Company (Cleveland, Ohio) ..	12	300	297.8333	89,350.00
Tilden Iron Mining Company.....	..	1,780	27.35	48,683.46
U. S. Cast Iron Pipe & Foundry Co. Preferred.....	..	1,987	44.444	88,310.89
U. S. Rubber Company 1st Preferred.....	8	300	101.2313	30,369.40
U. S. Steel Corporation Common.....	2	200	65.	13,000.00
Wilson Realty Company.....	..	591	100.	59,100.00
Woman's Hotel Company.....	..	300	80.	24,000.00
Woman's Hotel Company (Dividend Scrip \$750).....	..	...	80.	600.00
TOTAL MISCELLANEOUS STOCKS.....				\$14,610,555.94

*TOTAL SECURITIES BELONGING TO GENERAL FUNDS PRINCIPAL AND INCOME ACCOUNTS..... \$104,929,729.94

*NOTE—The securities representing Special Funds Exhibits B and C are not included in the above.

NOTE—All securities are valued at the price at which they were purchased or at the value assigned to them when they were donated, interest and dividends accrued at the date of purchase or donation being allowed for.

NOTE—The foregoing investments are apportioned as follows:

General Funds Principal.....	\$101,324,576.78
General Funds Income.....	3,605,153.16
	\$104,929,729.94

EXHIBIT O **SECURITIES IN LAURA S. ROCKEFELLER SPECIAL FUNDS**

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
Colorado Industrial Co. 1st.	5	Aug. 1934	\$50,000	80.	\$40,000.00
Virginia-Carolina Chemical Co.	5	Dec. 1923	10,000	93.	9,300.00
					\$49,300.00

LIST OF SECURITIES RECEIVED FROM THE ESTATE OF LAURA S. ROCKEFELLER **BONDS**

Atlantic Coast Line R.R. L. & N. Coll.	4	Oct. 1952	\$4,000	87.	\$3,480.00
Chesapeake & Ohio Ry. Conv.	4½	Feb. 1930	10,000	77.	7,700.00
Chicago, Rock Island & Pac. Ry. Refunding	4	April 1934	50,000	63.	31,500.00
Colorado Industrial Co. 1st.	5	Aug. 1934	20,000	78.	15,600.00
Imperial Chinese Government 5s of 1911.	5	Jan 22-51	£2,000	75.	7,500.00
National Rys. of Mexico, S. F. with Jan., 1915 and subsequent coupons attached.	4½	July 1957	\$50,000	59.	29,500.00
National Rys. of Mexico, Secured Notes 6s for coupons due Jan. 1, 1914.	6	Jan. 1917	1,125	59.	663.75
National Rys. of Mexico, Guaranty Trust Co. receipt for July 1, 1914, coupon.	3½	.....	1,125	59.	663.75
*Pennsylvania R.R. Conv. of 1905.	4	Oct. 1915	4,000	100.	.....
St. Louis, Iron Mt. & Southern Ry. U. & R.	4	Jan. 1929	20,000	63.	12,600.00
Seaboard Air Line Ry. 1st Mtg.	4	April 1950	2,000	79.	1,580.00
U. S. Mortgage & Trust Co. Series J.	4	May 1919	25,000	96.	24,000.00
Wabash R.R. 50-year 2nd Mtg.	5	Feb. 1939	3,000	90.	2,700.00
Western Maryland R.R. 1st Mtg.	4	Oct. 1952	75,000	70.25	52,687.50

TOTAL BONDS.....\$190,175.00

*Redeemed Oct. 1, 1915 (See Exhibit "M")

STOCKS

Consolidated Gas Co. Capital.....	7	.....	\$300	130.7083	\$39,212.50
Manhattan Railway Co. Capital.....	7	.....	36	128.	4,608.00
National Fuel Gas Co. Capital.....	10	.....	138	202.913	28,002.50
Ohio Fuel Supply Co. Capital (par \$25).....	8	.....	200	39.5833	7,916.67
Sheffield Farms-Slawson Decker Co. Preferred.....	6	.....	150	99.4	14,910.00
Title Guarantee & Trust Co. Capital.....	20	.....	75	380.	28,500.00
Western Maryland Ry. Preferred.....		.....	500	46.	23,000.00
TOTAL STOCKS.....					\$146,149.67
TOTAL SECURITIES.....					\$336,324.67

SECURITIES IN JOHN D. ROCKEFELLER SPECIAL FUND

Canada Southern Ry. Consolidated.....	5	Oct. 1962	\$37,000	100.	\$37,000.00
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APPENDIX



APPENDIX I

LETTERS OF GIFT¹

December 15, 1914.

The Rockefeller Foundation,
26 Broadway, New York City.

Gentlemen:

I hand you herewith twenty-five Canada Southern Railway Company Consolidated five per cent Gold Bonds, Series A, due October 1, 1962, Nos. 4501-4525, the income to be paid over currently to the Baptist Home for the Aged of New York City, so long as in the judgment of the Directors of the Foundation the Home is conducting the work for worthy aged people along useful and economical lines, whether such old people be Baptists or otherwise. When in the judgment of the Directors of the Foundation the income from this fund can no longer be properly appropriated to the work of the Home, in accordance with the provisions above set forth, the principal of the fund and any accrued income shall become a part of the unrestricted funds of the Foundation to be used for any of its corporate purposes.

The Foundation is to have the power in its discretion to sell these bonds and reinvest the proceeds and to change the investment from time to time, but is under no obligation so to do. The bonds and their proceeds shall be kept upon its books as a separate fund so long as the income is paid to the Home.

Very truly yours,

(Signed) JOHN D. ROCKEFELLER.

Enclosures.

¹ For previous Letters of Gift, see Annual Report for 1913-14.

February 11, 1915.

The Rockefeller Foundation,
New York.

Gentlemen:

I hand you herewith twelve Canada Southern Railway Company Consolidated five per cent Gold Bonds, Series A, due October 1, 1962, Nos. 4526-4537, the income to be paid over currently to the Baptist Home for the Aged of New York City, so long as in the judgment of the Directors of the Foundation the Home is conducting the work for worthy aged people along useful and economical lines, whether such old people be Baptists or otherwise. When in the judgment of the Directors of the Foundation the income from this fund can no longer be properly appropriated to the work of the Home, in accordance with the provisions above set forth, the principal of the fund and any accrued income shall become a part of the unrestricted funds of the Foundation to be used for any of its corporate purposes.

The Foundation is to have the power in its discretion to sell these bonds and reinvest the proceeds and to change the investment from time to time, but is under no obligation so to do. The bonds and their proceeds shall be kept upon its books as a separate fund so long as the income is paid to the Home.

Very truly yours,

(Signed) JOHN D. ROCKEFELLER.

Enclosures.

26 Broadway, New York.
November 10, 1915.

The Rockefeller Foundation,
61 Broadway,
New York City.

Gentlemen:

The will of the late LAURA S. ROCKEFELLER gave her residuary estate to her Executors in trust for charitable uses to distribute according to their discretion among certain enumerated corporations, with power to exclude any one or more absolutely, and with the power to apply any portion of the fund not used for said objects to such charitable corporations as they might select and in such sums respectively as they might deem proper. In exercise of that discretion, the said Executors and Trustees, on September 30, 1915, gave to the Rockefeller Foundation and delivered to its Treasurer the following securities:

4	Bonds Atlantic Coast Line R.R. L. & N. Collateral of 1952 at 87.....	\$3,480.00
10	Bonds Chesapeake & Ohio Ry. Co. Conv. of 1930 at 77.....	7,700.00
50	Bonds Chicago, Rock Island & Pac. Ry. 1st Refdg. of 1934 at 63.....	31,500.00
20	Bonds Colorado Industrial Co. 30 yr. Gold of 1934 at 78.....	15,600.00
10	Bonds Imperial Chinese Gov. 5s of 1911, at 75, Jan. 1922-51 Callable.....	7,500.00
50	Bonds National Railways of Mexico S. F. with Jan., 1915, coupons and subse-	

	quent coupons attached of 1957, at 59.....	\$29,500.00
	National Railways of Mex- ico Secured Notes, 6s, for coupon due January 1, 1914, of 1917, at 59.....	663.75
	National Railways of Mex- ico, Guaranty Trust Co. Receipt for July 1, 1914, coupon, at 59.....	663.75
4	Bonds Pennsylvania R.R. Conv. of 1905, of 1915, at 100.....	4,000.00
20	Bonds St. Louis, Iron Mtn. & Southern Un. & Refdg. of 1929, at 63.....	12,600.00
2	Bonds Seaboard Air Line Ry. 1st Mtge. of 1950, at 79.	1,580.00
25	Bonds United States Mort- gage & T. Co. 1st Se. J. of 1919, at 96.....	24,000.00
3	Bonds Wabash R.R. 50-Yr. 2nd Mtge. of 1939, at 90..	2,700.00
75	Bonds Western Maryland Ry. 1st Mtge. of 1952, at 70 $\frac{1}{4}$	52,687.50

\$194,175.00

Stocks

300	Shares Consolidated Gas Co., Capital, at 131.....	\$39,300.00
36	Shares Manhattan Railway Co., Capital, at 128.....	4,608.00
138	Shares National Fuel Gas Co., Capital, at 205.....	28,290.00
200	Shares Ohio Fuel Supply Co. (par \$25) at \$40.....	8,000.00
150	Shares Sheffield Farms-Slaw- son-Decker Co., Pfd., at 100.....	15,000.00

75 Shares Title Guarantee & Trust Co., Capital, at 380.	\$28,500.00
500 Shares Western Maryland Ry. Preferred, at 46.	23,000.00

\$146,698.00

• Total Bonds and Stocks..... \$340,873.00

On behalf of the Executors,

(Signed) STARR J. MURPHY,
Counsel.

APPENDIX II

WAR RELIEF APPROPRIATIONS

TO DECEMBER 31, 1915

	1914	1915	Totals
BELGIAN RELIEF:			
Food Supply:			
The greater part of five cargoes of supplies sent to Belgium.....	\$979,042.37	\$ 2,839.54	\$ 981,881.91
Clothing:			
Given to the Commission for Relief in Belgium for the purpose of material for clothing, to be imported into Belgium and manufactured by Belgian labor.....	.....	200,000.00	200,000.00
Relief Work in Holland:			
Establishment of an organization in Rotterdam for receiving, sorting and shipping clothing contributed from all parts of the world for Belgian sufferers; organization of Belgian women refugees into sewing and knitting classes; sewing machines and materials.....	.....	78,410.94	78,410.94
Stipends for Belgian professors in England.....	5,000.00	20,000.00	25,000.00
Total Belgian Relief...	\$984,042.37	\$301,250.48	\$1,285,292.85
SERBIAN RELIEF:			
Organization and maintenance in coöperation with the American Red Cross, of an American Sanitary Commission for Serbia, to combat an epidemic of typhus, \$99,332; contributed to the American Red Cross for the relief of destitution, \$5,000.....	.....	104,332.00	104,332.00
Carried forward.....	\$984,042.37	\$405,582.48	\$1,389,624.85

APPENDIX II—*Continued*

	1914	1915	Totals
Brought forward.....	\$984,042.37	\$405,582.48	\$1,389,624.85
ARMENIAN AND SYRIAN RELIEF:			
Contributed for the relief of suffering within the Turkish Empire and Northwestern Persia.....	.....	70,000.00	70,000.00
INTERNATIONAL COMMITTEE OF YOUNG MEN'S CHRISTIAN ASSOCIATIONS:			
For the establishment of Y. M. C. A. organizations and buildings in military prison camps in Europe.....	.....	25,000.00	25,000.00
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH:			
Surgical Laboratory at Com- piègne under the direction of Dr. Alexis Carrel.....	5,000.00	25,000.00	30,000.00
AMERICAN RED CROSS:			
To meet the expenses of send- ing a detachment of physi- cians and nurses to Europe (August, 1914).....	10,000.00	10,000.00
WAR RELIEF COMMISSION:			
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	<hr/>		
	\$1,004,613.06	\$557,339.58	\$1,561,952.64



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The
Rockefeller Foundation

Annual Report

1916

The Rockefeller Foundation
61 Broadway, New York

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THE ROCKEFELLER FOUNDATION

Report for the Year 1916

To the Members of the Rockefeller Foundation:

I have the honor to transmit to you herewith a report on the activities of the Rockefeller Foundation and on its financial operations for the year 1916.

The following members were re-elected at the annual meeting of January, 1916, for a term of three years:

John Davison Rockefeller, of New York, N. Y.,
John Davison Rockefeller, Jr., of New York,
N. Y.,
Frederick Taylor Gates, of Montclair, New
Jersey.

At the same meeting the following additional members were elected: Martin Antoine Ryerson, to serve until the annual meeting of 1919, and Harry Emerson Fosdick and Frederick Strauss, to serve until the annual meeting of 1918.

Appended hereto are the detailed reports of the Secretary and the Treasurer of the Rockefeller Foundation, the Director General of the International Health Board, the Director of the China Medical Board, and the Chairman of the War Relief Commission.

JOHN D. ROCKEFELLER, JR.,
President.

THE ROCKEFELLER FOUNDATION
OFFICERS, MEMBERS AND COMMITTEES
1916

President

JOHN DAVISON ROCKEFELLER, JR.

Secretary

JEROME DAVIS GREENE

Treasurer

LOUIS GUERINEAU MYERS

Comptroller

ROBERT HORNER KIRK

Assistant Treasurer

LEFFERTS MASON DASHIELL

Executive Committee

John Davison Rockefeller, Jr., *Chairman*

Simon Flexner

Jerome Davis Greene

Starr Jocelyn Murphy

Wickliffe Rose

Finance Committee

John Davison Rockefeller, Jr., *Chairman*

Alonzo Barton Hepburn

Starr Jocelyn Murphy

Nominating Committee

Frederick Taylor Gates

Harry Pratt Judson

Alonzo Barton Hepburn

Members

To serve until the annual meeting of 1919

Frederick Taylor Gates

John Davison Rockefeller

John Davison Rockefeller, Jr.

Martin Antoine Ryerson

To serve until the annual meeting of 1918

Simon Flexner

Harry Emerson Fosdick

Harry Pratt Judson

Starr Jocelyn Murphy

Frederick Strauss

To serve until the annual meeting of 1917

Charles William Eliot

Jerome Davis Greene

Wickliffe Rose

Alonzo Barton Hepburn

Charles Otto Heydt

THE ROCKEFELLER FOUNDATION
OFFICERS, MEMBERS AND COMMITTEES
1917

Chairman of the Board of Trustees
JOHN DAVISON ROCKEFELLER, JR.

President
GEORGE EDGAR VINCENT

Secretary
EDWIN ROGERS EMBREE

Treasurer
LOUIS GUERINEAU MYERS

Comptroller
ROBERT HORNER KIRK

Assistant Treasurer
LEFFERTS MASON DASHIELL

Executive Committee
George Edgar Vincent, *Chairman*

Wallace Buttrick
Simon Flexner

Starr Jocelyn Murphy
Wickliffe Rose

Edwin Rogers Embree, *Secretary*

Finance Committee
John Davison Rockefeller, Jr., *Chairman*
Alonzo Barton Hepburn

Starr Jocelyn Murphy

Nominating Committee
Wickliffe Rose

Alonzo Barton Hepburn

Martin Antoine Ryerson

Members

To serve until the annual meeting of 1920

Charles William Eliot
Alonzo Barton Hepburn

Charles Evans Hughes
Wickliffe Rose

George Edgar Vincent

To serve until the annual meeting of 1919

Frederick Taylor Gates
John Davison Rockefeller

John Davison Rockefeller, Jr.
Julius Rosenwald

Martin Antoine Ryerson

To serve until the annual meeting of 1918

Wallace Buttrick
Simon Flexner
Harry Emerson Fosdick

Harry Pratt Judson
Starr Jocelyn Murphy
Frederick Strauss

THE ROCKEFELLER FOUNDATION

Report of the Secretary

To the President of the Rockefeller Foundation:

Sir:

I beg to submit herewith my third annual report on the activities of the Rockefeller Foundation for the year ending December 31, 1916.

Respectfully yours,

JEROME D. GREENE,

Secretary.

THE ROCKEFELLER FOUNDATION

FUNDS

The executors of the estate of Laura Spelman Rockefeller (Mrs. John D. Rockefeller), acting within the discretion given them by her will and in conformity with her wishes, made additional gifts to the Rockefeller Foundation during the year amounting in value to \$86,860. The total amount received from Mrs. Rockefeller's executors is \$427,733. From this fund \$250,000 was given by vote of the Trustees to the General Education Board for its corporate purposes, and by that board fittingly applied upon certain terms and conditions to the benefit of Spelman Seminary.

CONSTITUTION, BY-LAWS AND RULES

Amendments of the Constitution and By-Laws were adopted during the year pertaining to the office and functions of the Comptroller, the powers of the Finance Committee, the bonding of financial officers, and access to the securities of the corporation. A body of Rules was also adopted for the administration of the International Health Commission and the name of this subsidiary organization was changed to International Health Board.¹

¹The Constitution and By-Laws of the Rockefeller Foundation, including the amendments, and the Rules of the International Health Board, will be found in the Appendix, see pp. 397 to 410.

EXPENDITURES

The expenditures of the Foundation and of its subsidiary organizations during the year under review may be summarized as follows:

Administration.....	\$94,160.74	
Equipment, Library, etc ...	7,557.73	
International Health Board .	505,900.99	
China Medical Board.....	549,558.57	
War Relief.....	966,667.55*	
Investigation of Industrial Relations.....	15,048.27	
Scientific Studies of Govern- mental Problems.....	50,000.00	
Gifts and Pledges to Un- affiliated Agencies for Ob- jects Designated by the Foundation.....	1,591,108.01	
Gifts for Objects Designated by the Founder in Accord- ance with his Letter of Gift of March 6, 1914.....	2,535,846.13	
Payments on Account of Special Fund of Laura S. Rockefeller.....	3,000.00	
Payments on Account of Special Fund of John D. Rockefeller.....	1,850.00	\$6,320,697.99

PUBLICITY AND OFFICIAL RECORDS

It has been the policy of the Foundation since its establishment to give publicity to its acts through the publication of all its expenditures, a very wide distribution of its annual reports and the occasional issue of bulletins. This policy was formulated for the permanent guidance of

* The Foundation appropriated \$2,590,000 for war relief during 1916, of which sum only the amount indicated had been actually expended before the end of the year.

the executive officers by the adoption of the following resolution on March 7, 1916:

"WHEREAS the Rockefeller Foundation is a charitable corporation, whose funds are dedicated to public uses, and can best accomplish the purposes for which it was established by securing the interest, sympathy and moral support of the public, and it is therefore its duty to keep the public accurately informed in regard to its activities; and

"WHEREAS the Foundation has been established to further 'the well-being of mankind throughout the world,' and as a result of studies along various lines is currently securing information and data which would be highly useful to the public if broadly disseminated; be it

"*Resolved* that the officers of the Foundation be, and they hereby are, authorized to take such steps, including the employment of individuals and organizations, as in their judgment may be necessary to accomplish these purposes."

As the functions and activities of the various boards established by Mr. John D. Rockefeller are not always distinguished by the public a pamphlet was issued during the year setting forth briefly the history, purposes, work, personnel, and financial resources of the Rockefeller Institute for Medical Research, the General Education Board and the Rockefeller Foundation, including the organizations subsidiary to the Foundation, namely, the International Health Board, the China Medical Board, and the War Relief Commission. Revised editions of this pamphlet are issued from time to time.

Full records of all transactions of the Trustees and of the Executive Committee are kept and vouchers are preserved for every expenditure

whether made on the direct authorization of the Trustees or the Executive Committee or by the officers acting under their instructions. After each meeting of the Trustees or of the Executive Committee a copy of the minutes is sent to every Trustee for his approval.

INTERNATIONAL HEALTH BOARD

The work of the International Health Board has expanded rapidly. To the list of countries in which work for the relief and control of hookworm disease has been carried on the following were added during the past year: Ceylon, Siam, Salvador, and Brazil; making sixteen countries in all, in which the Board is co-operating with governments. Meanwhile certain collateral activities referred to in the previous report have assumed more definite and significant proportions.

In fulfillment of the plans announced in the last report the Yellow Fever Commission entered upon its survey of actual or suspected foci of the disease. The Commission was composed of the following members: Major General William C. Gorgas, Medical Department, United States Army, Chairman; Dr. Henry R. Carter, of the United States Public Health Service; Dr. Juan Guiteras, of Havana; Major T. C. Lyster and Major E. R. Whitmore, of the Medical Department, United States Army; and Mr. W. D. Wrightson. The Commission sailed from New York on June 14, 1916, and visited Ecuador,

Peru, Colombia and Venezuela. In order to reach Brazil, owing to the impossibility of direct communication, the Commission returned to New York on September 25, and sailed on October 11 for the east coast of Brazil, returning to the United States on December 12, 1916.

The Commission's report expresses the unanimous opinion of its members that the eradication of yellow fever is feasible and that the present is an opportune time for beginning the work. Owing to war conditions there has been a great reduction in immigration into those countries in which yellow fever prevails. For lack of fresh human material upon which to "feed," the disease is now probably at its lowest ebb, and therefore a determined attack on the remaining cases offers excellent prospects of success in stamping out the infection. The resolutions adopted by the last Pan-American Scientific Congress on the subject of yellow fever and the cordial hospitality accorded to the Commission in all the countries visited indicate that the necessary practical steps toward the control of the disease in its seed-beds will enlist the hearty co-operation of the peoples concerned.

In accordance with authority granted by the Board, small experimental units for attempting the control of malaria by different methods were conducted at Crossett and Lake Village, Arkansas, and in Bolivar County, Mississippi. At

Crossett, a town with a population of 2,029, control was attempted entirely through simple measures for the elimination of mosquitoes. In comparison with previous years, a remarkable reduction of malarial cases occurred. The number of calls for malaria answered by the physicians of the town declined from 2,100 for the latter half of the year 1915 to 310 for the same period in 1916. This work was done within reasonable limits of per capita cost, and will be continued at the charge of the local authorities. Under the general direction of Dr. C. C. Bass, of Tulane University, microscopical examinations were made of all individuals in a selected area in Mississippi and the efficacy of quinine treatment as a measure of eradication has been subjected to a thorough study. It is as yet too early to report the results of this work.

A commission consisting of Dr. Richard M. Pearce, Professor of Research Medicine in the University of Pennsylvania, Major Bailey K. Ashford, Medical Department, United States Army, and Dr. John A. Ferrell, Assistant Director General of the International Health Board, visited Brazil in the early part of last year, leaving New York January 22, and returning May 7. The primary object of this visit was to make a study of medical education and public health agencies. The eradication of yellow fever from Rio Janeiro was one of the most brilliant achievements of modern sanitary ad-

ministration. The exchange of information and the establishment of friendly contact with a country which has made such a signal contribution to the welfare of this hemisphere is clearly of great importance to the medical as well as to the other cultural relations of North and South America. As a result of the Commission's visit arrangements have been made for the beginning of hookworm work on the usual basis of co-operation with government, and the State of Rio has enacted legislation creating a department of ankylostomiasis. The United States has been favored by the presence in this country during the same time of Dr. Carlos Chagas, the eminent bacteriologist of Brazil, and it is to be hoped that similar exchanges of visits between the two countries may be frequent.

The library of the Foundation is primarily a special reference and working library for hookworm disease. In addition to a collection of nearly all existing treatises and special articles on this disease the library contains a large amount of excerpted material bearing on the subject in health reports and scientific journals. This material is not only indispensable to the work of the International Health Board but is held at the service of individuals, governments, mining companies and other industrial organizations for which hookworm disease is a factor of large economic as well as humanitarian significance.

As a collateral activity, more or less incidental to the work for the relief and control of hookworm disease, the officers of the Board have been able to acquire much valuable information and to render service in respect to other important problems of public health. The long and fruitful experience of Dr. Victor G. Heiser, Director for the East, as Director of Public Health in the government of the Philippine Islands, has made him an appropriate adviser of the Board in all its contacts with such problems. His previous identification with proposals for the concerted action of East Asiatic countries in measures to control beriberi has made it fitting for him to continue his interest in the subject and it is hoped that when the war is over the simple expedients that are necessary to abate this scourge will receive the concurrent approval of the several governments, whereby alone they can be made effective.

Dr. Heiser's observations in the East in connection with soil pollution have an importance over and above that which this subject possesses in connection with hookworm disease. In western countries this is a question primarily of hygiene and cleanliness. In the East, on the other hand, it is also a question of direct economic importance, owing to the use of excrement for fertilizing purposes. The sudden stopping of soil pollution there would mean the impoverishment of the soil unless some substi-

tute were placed within the reach of the people. No such substitute is now available. If the problem could be economically solved in such a way as to utilize excrement without danger to the health of the people the result would not only be of vast economic significance to the East but might also prove to be of equal significance to countries where the same material is entirely wasted.

The prevention of hookworm disease, in places such as newly developed plantations in countries where it has not hitherto made its appearance, is a subject demanding early attention. Timely preventive methods have been proved to be justifiable as an economic investment and as such they should commend themselves to the managers of the industries involved. The fullest possible co-operation of the International Health Board is at their service in this important branch of hookworm work.

The report of the Director General of the International Health Board is supported by numerous statistical tables showing the volume of the Board's operations in each country and the results so far as they can be recorded. While it is agreeable to contemplate large contributions to the general welfare and happiness of the people among whom the Board's work is carried on and while it is not unreasonable to attribute such results to all well-directed efforts in the promotion of public health, it is the purpose of the Director General's report to lay emphasis

upon facts that are susceptible of accurate measurement and record, leaving the vaguer and more indirect benefits to be inferred only with the utmost conservatism until the future shall have demonstrated them more clearly.

CHINA MEDICAL BOARD

The report of the Director of the China Medical Board reveals significant progress in the main lines of work to which the Board is devoting its energies. These are (1) the promotion of medical education by the building up of schools with adequate personnel and equipment in Peking and Shanghai, and by substantial aid to the Hunan-Yale Medical School in Changsha; (2) grants in aid to hospitals of various missionary organizations; (3) the granting of fellowships to missionary physicians and to Chinese physicians in order to give them the advantages of special study; (4) aid in the translation of medical books including nursing text-books.

The organization of the Peking Union Medical College, as indicated by the Annual Report of 1915, was completed in May, 1916, when the Trustees organized under a provisional charter granted by the Regents of the University of the State of New York. The officers of the China Medical Board have been authorized to proceed with the purchase of land, construction of buildings and organization of the College on the basis of a preliminary estimate of the cost. The

Rockefeller Foundation appropriated funds for the purchase of land on which it is proposed to construct the laboratories, out-patient department, hospital wards, nurses' home and religious buildings. Dr. Franklin C. McLean, of the Rockefeller Institute for Medical Research, has been elected Professor of Medicine and Physician-in-Chief, and the preparatory department will be opened in September, 1917.

The organization of the Shanghai Medical College on the basis described in the preceding report was entrusted to a committee, but its report was not submitted until after the close of the year under review. Meanwhile the Red Cross Hospital, formerly used by the Harvard Medical School of China, has been leased by the China Medical Board in order to preserve the continuity of the clinical work and to give facilities to men chosen for the staff of the new college. Dr. Henry S. Houghton, formerly Dean of the Harvard Medical School of China, has been employed by the Board and placed in charge of the Red Cross Hospital.

In addition to its contribution of \$16,200 a year to the Hunan-Yale Medical School for a period of five years, the Board has appropriated \$30,000 for the construction and equipment of a laboratory. This school has been fortunate in securing co-operation and to a gratifying extent a sense of local responsibility on the part of the influential citizens of the Province.

By vote of the Board appropriations made to missionary societies for the support of medical missionaries and nurses are for a term of five years subject to certain conditions designed to ensure the successful fulfillment of the purposes of the appropriations. Appropriations for hospitals are hereafter to be made only upon the understanding that the societies making application shall contribute at least one fourth of the total sum required for increase of staff, equipment or plant.

Grants in aid have been made to the following missionary organizations:

American Baptist Mission Society (North).

Foreign Mission Board of the Southern Baptist Convention.

American Board of Commissioners for Foreign Missions.

Board of Foreign Missions of the Methodist Episcopal Church (North).

Board of Missions of the Methodist Episcopal Church (South).

Board of Foreign Missions of the Presbyterian Church in the U. S. A. (North).

Executive Committee of Foreign Missions of the Presbyterian Church in the U. S. (South).

Foreign Christian Missionary Society.

London Missionary Society.

Church of Scotland Foreign Mission Committee.

Canton Christian College for the Canton Hospital.

Nanking Hospital (Union).

Huchow Hospital (Union).

The several denominations having missions in Nanking have united to maintain one general hospital. To this general hospital the Board has appropriated \$9,250 for annual expense con-

ditioned on the raising of \$11,750 for the same purpose by the several missionary societies, and \$25,000 for buildings and equipment conditioned on the raising of an equal amount by the missionary societies.

At Huchow, the Northern Baptists and Southern Methodists have joined to maintain a union hospital costing \$48,500. Toward this amount the China Medical Board has subscribed \$20,000, payable when the balance shall be secured in cash. The Board has also pledged a total sum averaging about \$2,000 a year to cover three fourths of the cost during a period of five years of a foreign doctor, a foreign nurse, and a Chinese doctor.

The Board has contributed \$4,500 a year for five years to the Canton Christian College to be used for the current expenses of the Canton Hospital, the largest hospital in China.

The total amount appropriated for mission hospitals to be expended during 1916 is as follows:

For capital account	\$78,704.20
For current expenses	79,798.00
Total	<u>\$158,502.20</u>

The further sum of \$291,087 has been pledged to be paid during the next five years, of which \$20,000 is for capital expenditure and the remainder for maintenance.

The Board has contributed fellowships for graduate study in the United States to twenty-

seven medical missionaries on furlough from China. The cost of these appropriations for 1916 will be \$26,750. Seven Chinese doctors, of whom five have already held China Medical Board fellowships for a year, have also received grants during the year.

The China Medical Board has assumed a grave responsibility to the missionary societies and to the people of China as well as to the Trustees of the Rockefeller Foundation in its far-reaching plans for the improvement of medical education. Hope for the successful discharge of this responsibility lies in the enormous opportunity which China holds out for carefully directed effort in this field; in the earnest co-operation of the missionary body in presenting Western medicine at its best to the people of China, as an adjunct of Christian civilization; and in the expressed intention of the Foundation to give adequate support to the co-operative program now adopted.

PROMOTION OF MEDICAL EDUCATION

By its gifts in recent years to Johns Hopkins University, Washington University (St. Louis) and Yale University, the General Education Board, a corporation distinct from the Rockefeller Foundation and chartered by act of Congress in 1903, has given its support to an important movement aimed to place the clinical departments of medical teaching upon a thor-

ough going university basis. The method by which this result has been sought has been that of establishing so-called "full-time" professorships of the clinical subjects, so that these might be taught by men sufficiently free from the routine of professional practice and consultation to give their time and strength wholly to teaching and research.

Single-minded attention to teaching and research does not, as has been sometimes supposed, involve the substitution of the laboratory for the bedside. On the contrary, its advocacy is based on a more and more adequate appreciation of the subtlety and complexity of the human organism and of the consequent obscurity of the processes of health and disease. For this very reason the control of a university hospital or its equivalent, combining a varied and abundant clinical material with all the collateral resources of the laboratory, is regarded as the indispensable accompaniment of the "full-time" plan, and those who work under it will have a contact with the human patient as intensive or extensive as their work requires. The student trained under such a plan for private practice will have much to learn of the practical requirements of his profession. The same is true of the graduate of a course in industrial chemistry or law. He will learn from practice what only practice can teach. But he will bring to his work a disciplined mind thor-

oughly impregnated with the scientific spirit—a spirit that can be acquired best, if not solely, from teachers who are thoroughly imbued with it. The successful practitioner, thus trained, with his numerous patients and his comfortable income, may acquire a proficiency no less worthy than that of the university clinician, but a different proficiency. Of two men equally able one may be at his best in one calling, and one in the other, while neither could fill the other's shoes. The advocacy of university professorships of medicine or surgery, strictly so-called, is intended not only to differentiate these two callings but to raise the standard of both—to improve the private practitioner by giving him higher scientific ideals and a better discipline at the one time of life when he is most amenable to both; to improve the teacher and researcher by making it possible for him to subordinate all other considerations, whether pecuniary or social, to the training of his pupils and the advancement of medical science.

During the past year the General Education Board by vote of January 27, 1916, invited the co-operation of the Rockefeller Foundation in such measures as should be recommended "for the development of medical education in important centres of the country." The Trustees of the Foundation having immediately expressed their readiness to consider specific recommendations to this end, a communication was received

from the officers of the General Education Board on October 25, 1916, setting forth a "Plan for the Development of Medical Education in Chicago." The plan described the means which appeared to be feasible whereby a medical school of high rank might be established as an integral part of the University of Chicago, with a hospital and full-time staff of its own, reinforced by the co-operation and resources of certain other local institutions and funds, making the aggregate value of the plant and endowments thus brought together about \$14,300,000, of which \$5,300,000 would need to be raised. In response to these representations the Trustees of the Foundation then adopted the following resolution:

"Resolved that the Trustees of the Rockefeller Foundation have learned with profound interest of the plan by which it is hoped to create within the University of Chicago a medical school of high rank and adequate resources, and that the Executive Committee be, and they hereby are, authorized to make such contribution not exceeding one million dollars (\$1,000,000) through the General Education Board as shall seem wise to the Committee for the accomplishment of the above purpose, as set forth in the communication of October 23, 1916, from the officers of the General Education Board, payment to be made in such instalments as the Committee shall approve."

Since the close of the year under review private subscriptions have been assured to the amount necessary for the inauguration of this great project for a university school of medicine in Chicago.

It should be stated in this connection that while the Rockefeller Foundation has shown its disposition to co-operate with the General Education Board in the promotion of medical education, it does not itself entertain applications for gifts in this field, but refers to the General Education Board those who are concerned with such applications.

MEDICINE AND PUBLIC HEALTH

It will be apparent to anyone comparing the activities of the various boards established by Mr. John D. Rockefeller, that they have all touched the great field of medicine and public health in one or another of its aspects. The province of the Rockefeller Institute for Medical Research is to extend the bounds of human knowledge in everything pertaining to the causes and nature of disease, its treatment and prevention. In the performance of this function the Institute, while concentrating its resources at any particular time upon selected fields of work, ascribes worth and importance to all relevant studies, whether dealing with the fundamental facts and laws of organic life, or with the more direct application of those facts and laws to the problems of particular diseases. The General Education Board, by its co-operation with American universities, is helping them to raise the standards of medical education and research. The China Medical Board is be-

ginning a similar service to China, by strengthening the foundations of institutions in that country upon which the Chinese themselves will be enabled to build up their own structure of medical education, research and public health. The International Health Board, by its world-wide campaign for the relief and control of hookworm disease, by its plan of eradicating yellow fever, its studies of measures for the control of malaria, and its large program of public health as set forth in the resolutions establishing the Board in 1913,¹ is aiding the movement whereby the steadily increasing knowledge applicable to the prevention of disease is brought to the actual service of governments and peoples.

It is hardly necessary to point out the correlation of these main activities or the essential unity of the program of human betterment, which together they represent. But although the three elements of research, education and hygiene are all here represented, it has become more and more evident that the importance of the third element, hygiene, including public health and preventive medicine, has thus far failed of adequate recognition. Three serious evils are attributable to this failure; first, the lack of a sufficiently broad and sound basis of scientific knowledge for the systematic promotion of public and personal hygiene; second, the

¹ Annual Report, 1913-14, p. 11.

lack of a well-defined career as an attraction to able men whose interest is in this field rather than in the practice of medicine; third, the lack of due emphasis, in the training of practitioners of medicine, upon the importance of hygiene and of the practitioner's rôle as an apostle of hygiene no less than of therapy.

In the rapidly extending work of the International Health Board, calling for men adequately trained in public health, the fact has been only too well demonstrated that until very recently no body of men with such training has existed except as the health services of nation, state, and municipality have laboriously created it out of the ranks of medical practitioners, or as men trained in bacteriology or sanitary engineering have been able to step into positions requiring a command of those specialties. Consequently, the Board has had to borrow experienced men from other services, or to train its own men in the field—a training which though always essential can be made much more economical and productive if applied to men properly grounded in the principles and methods of preventive medicine as well as in the fundamental medical and engineering subjects. In this respect the experience of the Board has been identical with that of every public health organization which has striven to keep abreast of the time. Young men with a good professional training have been few and far to seek.

These considerations led the Trustees of the Rockefeller Foundation, by a resolution adopted December 20, 1913, to invite the attention of the General Education Board to the subject of professional training for public health work. The Board immediately undertook an inquiry into the subject and called a conference of prominent representatives of public health teaching and administration from different parts of the country. The results of this conference were crystallized and developed in a report prepared by Dr. William H. Welch and Mr. Wickliffe Rose, in which the ideals and organization of an institute of public health were set forth. A special committee consisting of executive officers of the General Education Board, the Rockefeller Foundation and the International Health Board was then appointed to consider the more concrete aspects of the subject, including the location and mode of organization of the proposed institute. A report from this committee was transmitted to the Trustees of the Foundation and considered by them at their meeting of January 26, 1916.¹ After full discussion a resolution was adopted "that an Institute of Public Health should be established" and the special committee was directed to recommend the steps to be taken to bring the institute into existence. At a meeting of the Executive Committee, April

¹ See Appendix V, pp. 415-427.

11, 1916, it was decided, upon recommendation of the special committee, to proceed with the elaboration of the plan in conference with the authorities of Johns Hopkins University. On May 24, 1916, the proposals of Johns Hopkins University for the organization of a School of Hygiene and Public Health were approved by the Trustees of the Foundation and referred to the Executive Committee with power; and on June 12, 1916, it was

"Resolved, that the executive officers be authorized to inform the President of Johns Hopkins University that the Rockefeller Foundation is prepared to co-operate with the University in the establishment of a School of Hygiene and Public Health for the advancement of knowledge and the training of investigators, teachers, officials and other workers in these fields."

At the same meeting an appropriation of \$267,000 was made to Johns Hopkins University, to cover the cost of a building and site and certain preliminary expenses. On the following day, when the establishment of the School was made known at the Commencement Exercises of the University, its Trustees announced the appointment of Dr. William H. Welch as Director of the School and of Dr. William H. Howell as Assistant Director and head of the Department of Physiology.

The School of Hygiene and Public Health is to be an integral part of Johns Hopkins University. It will be co-ordinate with the Medical School while drawing largely upon the resources

of the latter, and of the Engineering and other departments of the University, to supplement the more specialized instruction in public health branches. But the central and vitalizing feature of the School will be an institute of research in the sciences underlying hygiene and preventive medicine.

Much credit must be given to other institutions, notably the Massachusetts Institute of Technology, Harvard University, the University of Pennsylvania and the University of Michigan, for having led the way in research and technical training for public health work and to the distinguished sanitarians in national, state and municipal service for having in the face of almost overwhelming odds, created the nucleus of a new profession. American achievements in preventive medicine are among the best fruits of the new scientific era in our country. What is now needed is a more general recognition of public health work as offering to the ablest talent an attractive career, comparable in dignity and importance with medicine and the other established professions. Signs are not wanting that this recognition is beginning, and that the demand for trained health officers will more than keep pace with the output from the schools. It is to help meet this demand, including that for the supplementary training of men already possessed of practical experience, as well as to foster research, that the school at Baltimore

has been established. While the growth of the work of the International Health Board and of the China Medical Board and the demands of other large undertakings above mentioned in the domain of medicine and public health point to the concentration of the Foundation's resources in a few great fields, the Trustees have during the past three years aided a number of organizations that promise to have a marked influence on the diffusion of public health knowledge in this country. Among these may be mentioned the National Committee for the Prevention of Blindness, the National Committee for Mental Hygiene, the Training School for Dental Hygienists connected with the Vanderbilt Clinic, and the American Social Hygiene Association, all of which will be found on the list of the past year's expenditures.¹ It is not conceived to be the function of the Foundation to assume the burden of current support for such organizations. The Trustees have believed, however, that by aiding them at what has been the pioneer stage of their activities, results would be obtained which would not only be very far-reaching, but would help to secure that degree of public support to which such organizations may appropriately aspire.

¹ Pages 349 to 353.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

The complete list of gifts and appropriations printed in the Treasurer's Report contains several appropriations both by the Trustees and by the Founder to the Rockefeller Institute for Medical Research. These appropriations, in part for current expenses and in part for building, following an appropriation of \$1,000,000 for endowment made in the previous year, attest the confidence of the Trustees of the Foundation in the usefulness of money invested in productive research. It is of the very essence of modern scientific work that it should be subjected to universal discussion and criticism. By the same token its results when established come nearer to being of universal human benefit than any other form of philanthropic service; none other more truly, in the words of the Foundation's Charter, promotes "the well-being of mankind throughout the world."

EPIDEMIC OF INFANTILE PARALYSIS

The City and State of New York were sorely stricken by the epidemic of infantile paralysis which occurred during the past year. The total number of recorded cases for the State was 13,476 of which 9,290 were within the City of New York. At a meeting called by the Mayor of New York on July 12, a committee was appointed by the Mayor to consider measures for

the discovery and continuous observation of persons having had contact with known cases of infantile paralysis, so that possible consequences of such contact might be observed and fresh cases promptly reported and isolated. The committee having tentatively formulated measures to this end, in co-operation with the Department of Health, the Foundation appropriated the sum of \$50,000, or so much thereof as might be needed, for the assistance of the Department of Health through the agency of the Mayor's Committee. Dr. Alvah H. Doty, formerly Medical Officer of the Port of New York, was appointed Director of the work, and it was systematically carried on by him until the end of the epidemic. An appropriation was also made to defray the cost of similar work in the City of New Rochelle.

As the summer advanced and the number of cases greatly increased, it became apparent that the proper after care of survivors left crippled by the disease would severely tax the surgical and charitable resources of the city, and that there was grave danger that large numbers of children, especially those apparently only slightly paralyzed, might become seriously and perhaps needlessly crippled unless they could have prompt orthopedic advice and treatment. A conference of leading orthopedic surgeons of New York and other cities was called at the office of the Foundation in order that advice might be

obtained as to the best way in which the Foundation might be of service. In conformity with the advice received the Foundation gave its support to a committee organized by the Commissioner of Health, for the purpose of coordinating the efforts of the various hospitals, dispensaries and charitable agencies, so as to minimize the possibility that cases should be neglected from lack of knowledge of available facilities for treatment, or from lack of means. An initial appropriation of \$25,000 was made by the Foundation for the promotion of after care, nearly all of which was assigned to meet the administrative expenses of the New York Committee on After Care of Infantile Paralysis Cases, and classes for the special training of orthopedic nurses were organized through the generous co-operation of Dr. Robert W. Lovett of Boston. Appropriations were also made to the Brooklyn Bureau of Charities, in whose district a large proportion of the paralysis cases occurred, toward the actual cost of treatment and nursing; and to the State Charities Aid Association to meet expenses incurred by the Association in co-operating with the State Department of Health, which had efficiently organized and promoted the after care of paralyzed cases outside of New York City. An appropriation was also made to the Rockefeller Institute for Medical Research for the extension of its researches in infantile paralysis.

MENTAL HYGIENE

Reference was made in the annual report for 1915 to the assistance given by the Foundation to the National Committee for Mental Hygiene in carrying out a series of surveys in several states in regard to institutional provision for the insane. These surveys have been carried on during the past year and some of them are still in progress. Their fruitfulness and the confidence of the Foundation in the timely value of the general activities of the National Committee for Mental Hygiene has been such as to lead them to extend the loan of Dr. Thomas W. Salmon's services for the scientific direction of the Committee's work.

During the year a plan was developed for the establishment of an adequate medical service at Sing Sing Prison in which an important place was assigned to the psychiatric department. For this department the Foundation appropriated \$10,000 through the National Committee for Mental Hygiene. The discovery of mental abnormalities or disease is important for the humane adaptation of the penal, custodial, or therapeutic treatment to the needs of the individual prisoner; but it is not less important for the reason that it makes it possible to eliminate from the consideration of strictly penological problems the complications due to abnormal or pathological conditions.

WAR RELIEF

The amount of expenditures for war relief during the past year has been such as to necessitate the continuation of the War Relief Commission, both for the supervision of work aided by the Foundation and for the investigation of needs that were being brought to its attention. Early in the year Mr. Warwick Greene, Director of Public Works in the Philippine Islands, resigned that position to accept appointment as Director of the War Relief Commission, and sailed for Europe in March. He was accompanied by Mr. William J. Donovan, of Buffalo, as a member of the Commission. Before Mr. Greene's arrival Mr. Frederic C. Walcott, a member of the firm of William P. Bonbright & Company, had been appointed a member of the Commission, for the purpose, first, of inquiring into conditions in Belgium, and later of making a similar inquiry in Poland. In co-operation with a representative of the Commission for Relief in Belgium, and at the request of the German authorities, Mr. Walcott visited Poland and lent his best efforts to the revival of the plan for importing relief supplies into that country and distributing them there as had been permitted by the several belligerent governments in the case of Belgium. The diplomatic negotiations on this subject, with which Mr. Walcott and later Messrs. Warwick Greene and Donovan were associated, proved

unsuccessful, but the need in Poland, while subsequently mitigated with respect to certain articles of diet available locally, was still so serious with respect to other essential components of a living ration, and to clothing, that the devising of measures for bringing relief, in some form acceptable to all the governments concerned, continued for the whole year to engage a large share of the Commission's attention. In the hope that these efforts might prove successful, and in order that prompt advantage might be taken of any favorable opening, the Trustees at their meeting of May 24, 1916, appropriated the sum of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania. The Balkan countries were included with Poland in this appropriation in order that they might profit by any arrangement permitting the importation of supplies into territory occupied by the Central Powers.

In September arrangements were consummated for importing a limited amount of condensed milk into Poland from Switzerland, and for the remainder of the year a quantity of milk was thus imported sufficient to eke out the ration of about sixteen thousand children in Warsaw and Lodz. The children thus fed were chiefly those between the ages of one and a half and five years, the infants under one and a half years having already been given the preference in the distribution of existing supplies of milk.

All of this relief work, initiated by Mr. Warwick Greene, was under the personal direction of Mr. Reginald C. Foster, of the War Relief Commission, upon whose guarantees as to the faithful delivery of supplies to their destination the continuation of the relief has depended. Local committees were organized in both Warsaw and Lodz to supervise the delivery of food, the committees consisting in each case of the representative of the Rockefeller Foundation, the American Consul, and a number of Polish citizens of high standing in the community. In the transactions above described, as in all the activities of the War Relief Commission, its members have regarded themselves as strictly accountable to the supervisory authorities of the governments concerned and have scrupulously observed all the limits set upon their activities by the exigencies of the war. Upon no other condition could an agency whose operations are necessarily carried on in part under the supervision of one group of belligerents, and in part under that of their opponents, enjoy the respect and confidence of the military and civil authorities.¹

For the proper conduct of the work of the War Relief Commission it was found advisable to establish headquarters in Berne, Switzer-

¹ For the instructions issued to all war relief agents of the Foundation, see Appendix, page 411.

land, with a small office staff. With this base of operations the Director of the Commission has been able to keep in fairly close contact with matters requiring his attention in all the adjacent countries, and particularly with the work done by the Foundation in co-operation with the generous people of Switzerland, in offering a refuge for Belgian children from the fighting zone. In this undertaking the Foundation has had the sympathetic assistance of the Belgian Relief Committee of New York, which contributed \$25,000; the Belgian Relief Committee of New England, which contributed \$10,000, and the Refugees' Relief Fund, which made an initial gift of \$1,000 followed by monthly contributions amounting in all to \$3,000. The total cost of this work, approximating \$75,000 for a maximum of five hundred children in the first year and \$51,000 in the second year, if necessary, was guaranteed by the Foundation.

As will be seen in the table accompanying the appended report of the Chairman of the War Relief Commission, the Foundation continued to make appropriations for Armenian and Syrian Relief (\$590,000), for the aid of Belgian professors in England (\$15,000), for relief in Serbia, through the American Red Cross (\$30,000), for the welfare of prisoners of war through the International Committee of Young Men's Christian Associations (\$200,000), and for re-

lief work in Turkey, through the American Red Cross (\$25,000).

The admirable work for prisoners of war done by the International Committee of Young Men's Christian Associations and by the International Red Cross at Geneva, and the activities of some scores of prisoners' relief agencies conducted in Switzerland and elsewhere were made the subject of special study by the War Relief Commission with a view to ascertaining whether these various activities might not, through some co-operative arrangement, become even more serviceable to the five or six millions of able-bodied men in prison camps whose welfare is a matter of such deep concern to their respective countries. This subject was brought before the Trustees in the latter part of the year under review, and the Director of the War Relief Commission was authorized to make such further inquiries as might be necessary to determine the feasibility of larger and more effective measures for the relief of prisoners. A conditional appropriation of \$500,000 was made for this purpose.

For medical research at the seat of war the Foundation has continued its appropriation through the Rockefeller Institute, to which reference was made in the last annual report. A part of this appropriation was applied during the year to research on the subject of shock at the Belgian Red Cross hospital in La Panne, and the Institute had the good fortune to enlist

the services of Professor William T. Porter of Harvard University in this study.

TUBERCULOSIS IN FRANCE

From time to time during the past year appeals were made to the Foundation in behalf of agencies formed to combat the increase of tuberculosis in France. After a preliminary report on the situation had been made by Professor Wallace C. Sabine of Harvard University, a member of the War Relief Commission, the Trustees of the Foundation requested Dr. Hermann M. Biggs, Commissioner of Health of the State of New York, to visit France in order to study the situation more fully and to recommend what aid if any a foreign agency might render in co-operation with the public authorities. The French Government expressed its cordial sympathy with Dr. Biggs's mission and he sailed for Europe on January 9, 1917, as a member of the War Relief Commission. He was accompanied by Dr. Alphonse R. Dochez of the Rockefeller Institute as his assistant and Mr. Geoffroy Atkinson of Columbia University as secretary and interpreter.

SOLDIERS' WELFARE WORK ON THE MEXICAN BORDER

On the application of the International Committee of Young Men's Christian Associations, the Foundation made two appropriations of \$50,000 each for the welfare work so promptly

and efficiently organized by that Committee for the benefit of the soldiers of the United States Army serving on the Mexican border. The Foundation also contributed \$15,000 for the purchase and distribution of small circulating libraries to be maintained at the recreation centres of the various brigades.

The importance of providing educational, recreational, and religious opportunities for men in camp has been so conclusively demonstrated in this country and in Europe that it is hard to see how a factor bearing so directly on the morale of troops and hence upon their fighting efficiency can hereafter be omitted from any intelligent system of military "preparedness." But the greatest significance of this work is suggested by the potentiality for good or ill that lies in any such large aggregation of men, drawn largely from civil life and eventually to return to their home communities, either broadened and disciplined by their experience, or demoralized both morally and physically.

INTERSTATE PALISADES PARK

In response to an appeal made on behalf of the Interstate Palisades Park Commission, a body created with identical personnel by separate action of the states of New York and New Jersey, the Foundation made a contribution of \$1,000,000 to the Commission toward a fund of \$5,000,000 raised in part by legislative

appropriation and in part by private subscriptions. This large gift for an isolated project lying outside the fields to which the attention of the Trustees has been chiefly directed was occasioned by the emergency which threatened the destruction for commercial purposes of the one portion of the Hudson Palisades not previously secured to the public enjoyment and by the urgency which attached to the early preservation of an extended region back of the Palisades in addition to the areas already acquired by the Interstate Commission. The Palisades are a national monument of great beauty, worthy to be held forever as one of the most precious possessions of the American people. The great park of which they form a part has been saved for the recreation and enjoyment of all classes of the population in the metropolitan district; and its preservation in anticipation of the time when that district must inevitably become a desert of brick and stone, relieved by only a few urban parks, is sure to become recognized as a thoughtful provision for future generations comparable with that which, half a century ago, by the creation of Central Park, conferred a priceless boon upon the New York of to-day. It is happily true that the Palisades Park is already availed of by hundreds of thousands of the masses of the people in this day and generation; and it is a source of profound satisfaction to the Trustees of a Foundation which owes its cor-

porate existence to the State of New York to have been enabled to give this immediate token of obligation to its people.

The Foundation has shown by two substantial gifts its recognition of the vital and urgent importance of two closely related interests of the people of the United States. The first is the pre-empting, before it is too late, of such available areas as are necessary, whether for urban or suburban parks, or for the more extensive state and national forest reservations. The second is the protection of birds and other forms of wild-life, many of which are in danger of extinction, such protection consisting in part of federal and state game laws and in part of wild-life refuges whether within the bounds of parks and forests reserved also for other uses or in lowland and marsh districts marked off for this special purpose. By its purchase and dedication in 1913 of the Grand Chenier Tract of 85,000 acres on the southern shore of Louisiana as a refuge for birds and other forms of wild-life, and by its contribution to the Interstate Palisades Park in 1916, the Foundation has sought to confer a public benefit measurable not only by the immediate usefulness of these two tracts, but also by such aid and encouragement as have been given to a movement of national extent and importance—a movement which ought to engage the timely and liberal support of both public and private funds.

FOUNDER'S REQUISITIONS

The Treasurer's Report contains the customary list of Founder's Requisitions—by which is meant appropriations for objects designated by Mr. John D. Rockefeller and approved by the Trustees as coming within the corporate purposes of the Foundation. These requisitions are made in accordance with Mr. Rockefeller's letter of gift of March 6, 1914, reserving \$2,000,000 from each year's income for this purpose. While many of Mr. Rockefeller's beneficiaries under the terms of this letter, are, and were expected to be, local or denominational charities in which his interest is largely personal, it will be noted that not a few are closely identified with the broader interests of philanthropy, among which are to be noted the Rockefeller Institute for Medical Research, the National Board of the Young Women's Christian Association, the International Committee of Young Men's Christian Associations, Cornell University and the Training School for Public Service of the Bureau of Municipal Research.

EXTRA COMPENSATION TO EMPLOYEES

In recognition of the increased cost of living due to the abnormal conditions caused by the European war, an additional and special compensation equal to fifteen per cent of the current annual salary was appropriated by the Executive Committee to each regular employee attached

to the New York office, the amount being payable January 5, 1917. It was understood that this was not an increase of the regular salary and did not create a precedent for the future. Similar action was taken by a large number of private business houses and commercial institutions in New York City and elsewhere in recognition of conditions that, by common acknowledgment, bore with special severity upon salaried workers.

APPENDED REPORTS

Appended hereto will be found the more detailed reports of the Director General of the International Health Board, the Director of the China Medical Board, the Chairman of the War Relief Commission and the Treasurer of the Foundation.

In submitting this my third and last report as Secretary of the Rockefeller Foundation, and in retiring from the Board of Trustees, I beg to acknowledge my obligations to the President and Members of the Corporation for the unique opportunity of working with them in the inauguration of this Foundation. To my colleagues and fellow-employees on its staff I wish to express my gratitude for their able and unfailing co-operation.

INTERNATIONAL HEALTH BOARD
Report of the Director General

To the President of the Rockefeller Foundation:

Sir:—

I have the honor to submit herewith my report as Director General of the International Health Board for the period January 1, 1916, to December 31, 1916.

Respectfully yours,

WICKLIFFE ROSE,
Director General.

INTERNATIONAL HEALTH BOARD

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WICKLIFFE ROSE*

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Assistant Director General

Ernst Christopher Meyer, Ph.D.

Director of Surveys and Exhibits

Hector Haldbrook Howard, M.D.

Director for the West Indies

Victor George Heiser, M.D.

Director for the East

William Perrin Norris, M.D.

Associate Director for the East

* Member of the Executive Committee.

I. GENERAL SUMMARY

I

THE YEAR IN BRIEF

During the year 1916 the work of the International Health Board continued to be directed chiefly toward the relief and control of hookworm disease. In coöperation with Government, systematic efforts toward control have now been inaugurated in eight of the Southern States and in fifteen foreign countries located between degrees of latitude 36 north and 30 south in the tropical and sub-tropical belt which is the native habitat of the hookworm. New fields of operation in 1916 were Salvador, Brazil, Ceylon, and Siam. Arrangements were also completed to start work early in 1917 in the Fiji Islands, in Papua, and in Queensland, Australia.

In British Honduras and the island of Barbados, preliminary infection surveys were made; and in the Yangtse-kiang Valley of Central China a preliminary survey was carried out with special reference to the problem of soil pollution in shallow mining operations.

The Board conducted during the year a series of four experiments in malaria control. Three were finished. The fourth will be completed in

1917. The object of all four experiments was to determine the degree to which malaria could be controlled within the limits of reasonable expenditure and under conditions prevailing in typical farm communities of the South. Gratifying results have been obtained.

Two commissions were sent to South America. One, composed of six sanitarians, with Major General William C. Gorgas as chairman, visited the Republics of Ecuador, Peru, Colombia, Venezuela, and Brazil to study yellow fever conditions. Two definite objects were sought: (1) to determine the status of doubtful endemic centers of infection; (2) to ascertain what measures were necessary and feasible to eradicate the disease from the localities responsible for its dissemination. The second commission investigated medical education and public health agencies in Brazil. Each of the above activities, as well as minor undertakings, will be reviewed in subsequent sections of this report.

Evolution of Working Methods

Experience derived from working in many countries, with their great diversity of races, languages, and racial prejudices, is gradually evolving working methods adapted to diverse conditions. In this, the staff has been fortunate in meeting with a universally cordial reception and generous coöperation on the part of Government officials and the medical profession in the

countries visited or in which work has been begun. It has also been fortunate in encountering a Governmental attitude of great patience in dealing with native populations—an attitude that accomplishes results by persuasion rather than by force. The field staff has endeavored to show the same patient spirit and as a result has found happy issues out of emergencies which could not otherwise have been overcome—emergencies arising from illiteracy, superstition, religious intolerance, and apathy on the part of native populations. The working methods that are wrought out in one field are immediately available for use in every other similar field. Thus, a director who enters a new territory now has a vast amount of experience upon which to draw in making plans.

Development of Field Staff

Inasmuch as the success of the work in any area is largely dependent upon the personality, character, and general fitness of the director in charge, in making selection for field directors great care is taken to choose men who, after a period of probationary training, may become qualified to act in administrative positions. During 1916 the field staff was increased from twenty to thirty-six members. In making the new appointments the Board gave preference to physicians under thirty-five years of age who had received an academic degree, who had a

medical degree from an institution of recognized standing, and who had served a hospital internship of at least twelve months. In the few exceptions to these requirements, the candidates presented a record of excellent training for the service or possessed unusual personal qualifications.

Training of Recruits

It is the policy of the Board to place no medical officer in a position of administrative responsibility until he has stood the test of practical work in the field. In 1916 the islands of Trinidad and Ceylon were used as training centers. These remote locations, however, offered serious disadvantages. The work could not be supervised adequately from the home office, and unnecessary expense was involved in transporting to places so distant, untried men who might not prove satisfactory. For these reasons it was decided to transfer the training centers to a convenient section of the Southern United States. The Board selected North Carolina. Dr. B. E. Washburn, formerly in charge of the training of recruits in Trinidad, is director of the new station.

When the recruit has received preliminary training in North Carolina, he completes his probationary period under an experienced director in a foreign country located as near as possible and presenting similar problems to the

region in which he is to do independent work. If he is to serve in Latin America, his training is completed in a Latin-American country in which work is being done; if he is to serve in the British West Indies, he is trained on one of those islands. By this plan, a trustworthy idea of the capabilities of each new director is gained and the director himself secures as thorough equipment as possible for his future effort.

Publications and Exhibit Material

The need of satisfactory printed matter and exhibit material for use of field officers has become increasingly urgent. Accordingly, with the assistance of a number of medical men and special artists, original material was prepared during the year to illustrate the story of hook-worm disease. This equipment includes small, light, easily transportable, and durable lecture charts adaptable for use in any language; the same material, with suitable text, in the form of a chart for schools; a set of about fifty selected lantern slides and an accompanying popular lecture designed to furnish sufficient information to enable a man to give an intelligent talk; an illustrated leaflet telling in language which young children will understand the story of the hook-worm and its importance to every child of the South; and other similar printed matter. The Board coöperates with boards of health, boards of education, and other exhibitors in supplying

this material, as well as slides, photographs, and specimens of hookworms, for exhibits and teaching purposes.

In 1912 and 1913 Dr. E. K. Strong, Jr., of George Peabody College for Teachers, and Dr. C. W. Stiles, of the United States Public Health Service, made a study of the relation of hookworm disease to the physical and mental development of children. Their report was published in 1916. A Spanish edition of the Board's second annual report was also prepared and sent to medical journals, medical schools, public health officers, government officials, and many private individuals in Latin America.

Collection of Information

A vast amount of literature written in many languages was collected during the year. A special bibliography was made on the incidence of hookworm disease in mines. Much information also was gathered on medical education and public health agencies. All of this material was classified, indexed, translated, and made available for the guidance of the officers of the Board and other interested persons.

Coöperation with Tropical Diseases Bulletin

The *Tropical Diseases Bulletin*, a publication issued under the auspices of the British Government, has created a special department for recording work for the relief and control of hook-

worm disease. The object is "to devote periodically a section to an account of the various hookworm campaigns in progress from time to time in tropical regions, and to supplement the summaries of the official reports issued by the International Health Board with abstracts of the more interesting local details and observations made by the medical officers in charge to the local officers in their periodical reports." The *Bulletin* is widely circulated in tropical countries; it will therefore give to the work desired publicity.

II

RELIEF AND CONTROL OF HOOKWORM DISEASE

Active measures to control and prevent hookworm disease are now in operation in Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia; in Antigua, Grenada, St. Lucia, St. Vincent, and Trinidad of the West Indies; in British Guiana and Dutch Guiana; in Costa Rica, Guatemala, Nicaragua, Panama, and Salvador of Central America; in Brazil; and in Ceylon and Siam of the Far East.

Complete Infection Survey

A new and valuable development of the service is the complete infection survey which gives to Government and to the Board definite infor-

mation upon which to base a future working program.

Two such surveys were made in 1916, in Barbados and in British Honduras, respectively. They brought to light many striking facts. They showed particularly the important relation between geological structure and hookworm infection. The greater part of the island of Barbados is composed of porous coral limestone, which allows rapid seepage and percolation. The ground dries quickly, a condition unfavorable to the growth of young hookworms, and even though the thin superlying stratum of soil is polluted by fecal matter, this matter may easily seep away during subsequent rain. The smaller portion of Barbados, known as the "Scotland district," has an underlying structure of impervious sandstone and clay. This picturesque, highland district shows heaviest infection; it is estimated that in it 25,000 persons suffer from hookworm disease within an area of less than twenty-five square miles. The amount of infection in the island is further modified by the exceedingly low rainfall. In 1913 the rainfall was 46.16 inches; in 1914, 36.9 inches; in 1915, 56.7 inches. The average rainfall for a tropical country is about 100 inches; in British Guiana it is more than 200 inches.

In British Honduras, when other contributing factors have been eliminated, the rate of infection is seen steadily to increase as one travels

south, following a change in geological formation from porous limestone to impervious clay. The average rainfall of British Honduras is about 81 inches.

Interesting data as to race distribution of hookworm disease were also brought out by the two surveys. In British Honduras the greatest incidence is found among Indians and Mestizos, the latter being a mixture of Spanish and Indian blood. The Negro-creoles who have lived in the colony for several generations are, clinically speaking, almost immune. In Barbados the "poor whites" bear the brunt of the disease, as is indicated from personal appearance and hemoglobin tests. The blacks, though heavily infected, do not deteriorate to such a degree as the white population.

A great lack of knowledge on the part of native populations as to the dangers attendant on soil pollution, has been found in all tropical countries in which the Board has worked. A recent sanitary inspection of Barbados showed that of 4,240 houses visited, 2,132 had no sanitary conveniences; 1,387 had water closets or latrines; the remaining 721 had holes or receptacles of a primitive sort, or none. In British Honduras, in all parts of the colony outside the city of Belize, both in district capitals and in rural settlements, fecal contamination of the soil is universal. As a result, hookworm disease is making increasingly serious ravages among

agricultural workers, as is recognized by planters, particularly in the southern districts.

Hookworm Infection in Mines

Germany has spent over \$2,500,000 in direct outlay to control hookworm infection in a few of its mines. The disease has been brought under reasonable control in the mines of Wales and Belgium. It is known to be prevalent in many of the mines of France, Hungary, Spain, Sicily, California, South America, and China.

Until 1916 the Board had not undertaken directly the relief and control of hookworm disease in mines, though by supplying literature it had stimulated active measures in some of the mines of Ecuador and California and had awakened interest in the subject in certain tin mines of Spain. The field, however, offers large opportunity for service with but small expenditure of funds.

Infection Survey of Yangtse-kiang Valley

In 1916 the Yale Medical School, through a subvention by the Board, carried out a partial infection survey in the Yangtse-kiang river valley of Central China, a vast agricultural region in which extremely active shallow coal mining and antimony mining operations have sprung up since the beginning of the world war. The entire valley, so far as examined, was found to be infected, the infection being greatest among

farm coolies and miners, particularly in the provinces of Hunan and Kiangsi.

Economic Importance of Human Excrement to China

The hookworm problem in China presents unique features because of the economic importance of human excrement as a fertilizer and a source of revenue to the state. It is the only fertilizer available in sufficient quantities to supply agricultural needs. China has no sewerage system. Each night in urban centers the excrement is collected by male and female coolies who carry it in wooden buckets to temporary storage depots outside the city walls. To these depots farmers and gardeners go in tank boats to purchase supplies, which they convey up the rivers to their plantations of rice and mulberry. There they dig the excrement into the fields or moisten it with water and sprinkle it over growing vegetation. A relatively light infection in Chinese cities may thus become a serious factor in spreading the disease to agricultural districts.

More than one hundred thousand miners, largely recruited from farmers who have worked barefoot in the moist, larva-infected soil, are employed in the mines of Hunan province alone. The Government authorities and mine owners have waked to the seriousness of this situation and have made inquiry of the Board regarding the nature of hookworm disease and possible measures for its control. As a result, a plan of

coöperation in a program of sanitary reform has been entered into between the Board and the mining interests of Hunan and Kiangsi provinces. Dr. F. C. Yen, dean of the Yale College of Medicine at Changsha, has been placed in charge of the initial stages of the work. Dr. Yen is at present in the United States, studying systems of public health work, in preparation for the undertaking in the mines of China.

Sewage Disposal in Rural Districts

It becomes increasingly apparent as the work of the Board progresses that the solution of the problem of soil pollution in rural districts, both of this country and foreign countries, would have a far-reaching effect in lowering death rates and furthering public health. Typhoid, dysentery, diarrheal diseases, especially those of infants in summer time, and similar enteric infections, are in large measure due to this widespread custom of polluting the soil.

There is still diversity of opinion among public health officials as to the best method of disposal of human excrement in rural communities with limited means. In its work for the control of hookworm disease, the Board has made it a rule to coöperate in the installation of such devices as are recommended by the departments of health in the several states and countries.

In January, 1916, provision was made for carrying out, under the direction of the Rocke-

feller Institute for Medical Research, a study of the relative efficiency of various types of latrines suitable for farm use. The investigation will cover several years. It is hoped that as it progresses many sanitary experts will become interested and coöperate in the undertaking.

Uncinariasis Commission to Orient

In 1914 the Director General, while visiting the Federated Malay States, was impressed with the amount of hookworm disease and malaria which prevailed in that section. The local medical profession seemed divided as to which of these two diseases was the real menace to working efficiency, and as to the interrelation between the two. In 1915 an Uncinariasis Commission, with Dr. S. T. Darling as chairman, was sent out to investigate this problem. The Commission has now completed its work in Malaya and in Java, and has proceeded to the Fiji Islands in order to continue the study in a country where hookworm disease is not complicated with malaria.

III

MALARIA CONTROL

Four experiments in malaria control were carried out during 1916 at different points in the lower Mississippi river valley. In each a different line of investigation was pursued, the object

being to discover a practical method of control which the average rural community could afford.

Experiments in Bolivar County, Mississippi

An experiment was conducted under the administration of the Mississippi Department of Health, with Dr. W. S. Leathers as Administrative Director and Dr. C. C. Bass of Tulane University as Scientific Director. The practicability of control through detecting the carriers and freeing them of the malaria parasites, was tested. The experiment covered two hundred twenty-five square miles of territory, the size of the communities varying from nine to sixteen square miles, with an average population of one thousand. Adjoining communities were taken up one after another as facilities permitted, the work in each lasting about four weeks, with subsequent visits to insure thoroughness. Blood tests were taken. Quinine treatment was given to those found infected. The experiment will be continued in 1917.

Experiments at Lake Village and Crossett, Arkansas

Three experiments were carried out, two at Lake Village and one at Crossett, in coöperation with the United States Public Health Service and under the general supervision of the late Dr. R. H. von Ezdorf. Assistant Surgeon R. C. Derivaux and Dr. H. A. Taylor were in charge of the work.

At Lake Village, 103 homes were selected from plantations in the immediate vicinity of the town. These 103 homes were divided into groups: in Group A, control was based on screening; in Group B, on the issuance of prophylactic doses of quinine; in Group C, on a combination of the two measures. A fourth group of houses was kept under observation as an experiment in negative control. The experiments at Lake Village have been completed, but it is too early to announce their results.

The experiment at Crossett was based on mosquito control without major drainage operations. The work consisted of the draining and re-grading of natural streams so as to secure rapid off-flow, the filling of bottoms, the digging of ditches, the removal of accumulated vegetation, and the systematic use of oil and other larvacidal substances by sprays and automatic drips. A remarkable decrease in the number of malaria calls resulted. During the last six months of 1915 there were 2,100 malaria calls in Crossett; during the last six months of 1916, 310 calls. In October 1915, there were 600 calls; in October 1916, 46 calls. In December 1915, there were 100 calls; in December 1916, 4 calls. Thus, at the end of 1916, the malaria index had been brought far below the normal winter level and was approaching the zero point. (See chart, page 69.) As a result of the steady

decrease in malaria cases, community interest in Crossett was aroused to take over the work for 1917, with a view to making it permanent. A similar experiment was also undertaken and is now in progress at Hamburg, Arkansas.

IV

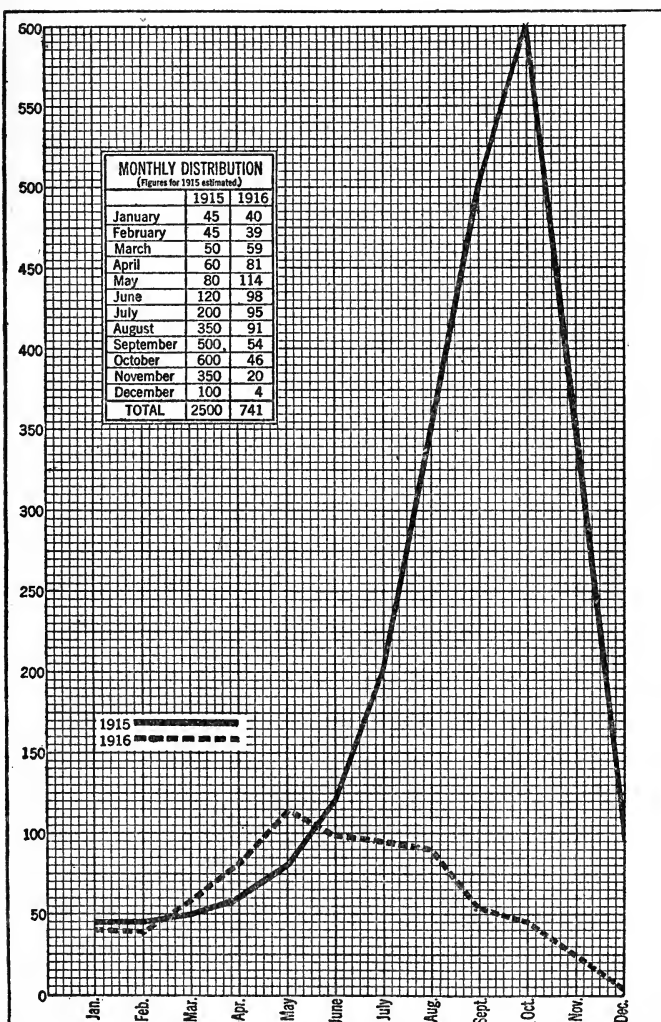
WORK OF THE YELLOW FEVER COMMISSION

The work of the Yellow Fever Commission resulted in defining the problem, so far as South America is concerned, and in preparing the way for extending into new areas definite measures for the eradication of yellow fever infection.

The Commission consisted of Major General William C. Gorgas, Dr. Juan Guiteras, Dr. Henry R. Carter, Major T. C. Lyster, Major Eugene R. Whitmore, and Mr. William D. Wrightson. It was appointed early in the year and sailed from New York on June 14. It finished its work in December, after a period of investigation of approximately six months' duration.

Cordial Reception by Government

In each country visited the Commission met with a cordial reception from Government officials, who showed appreciative recognition of its distinguished personnel and of the spirit of service to humanity which had prompted its



**CALLS FOR MALARIA, 1915 AND 1916, CROSSETT, ARKAN-
SAS (POPULATION 2,029)**

**Office, Hospital, and Residence Calls Included; Monthly Distribution
for 1915 Estimated.**

visit. All that could be done was done to facilitate the investigation. Public records were displayed, hospitals and health organizations were shown, medical boards were convened in consultation, and many social courtesies were extended. These tokens of good will and interest facilitated greatly the progress of the investigation.

Findings of the Commission

The Commission reported that so far as it could determine, the only endemic center for yellow fever in South America at present is Guayaquil, Ecuador. Peru seems free from infection, but certain sections of Colombia, Venezuela, adjacent West Indian islands, and the entire east coast of Brazil call for close observation.

The problem of yellow fever eradication resolves itself into the following specific undertakings: (1) the elimination of the infection from Guayaquil, the chief seed-bed of infection now existing in South America; (2) the keeping under observation of the east coast of Brazil and the southern littoral of the Caribbean sea, and the undertaking of intensive work for the control of yellow fever infection at any point where it may be discovered; (3) the extension of the investigation to Mexico and West Africa, which regions are under suspicion, but have not yet been examined.

Adoption of Working Plan

The Board has appointed General Gorgas to direct the practical work of eradication along the three lines mentioned. It was expected that the work would begin in March, 1917. On account of war developments, however, it has been necessary to postpone the greater part of the undertaking.

V

MEDICAL COMMISSION TO BRAZIL

The Medical Commission to Brazil, composed of Dr. Richard M. Pearce, chairman, Dr. John A. Ferrell, and Dr. Bailey K. Ashford, sailed from New York on January 22, and returned on May 7. Its inquiries covered the ground of medical education, hospitals and dispensaries, public health agencies, and sanitary progress.

Coöperation for Hookworm Control

As a result of the visit, the Government of Brazil has asked the Board's coöperation in carrying out demonstrations in hookworm control in selected areas in the States of Rio de Janeiro, Sao Paulo, and Minas Geraes, and on an island in the harbor of Rio de Janeiro in the Federal District. The Government has created a Department of Uncinariasis and appointed as its Director the Board's representative, Dr. L. W. Hackett, who will have charge of the four demonstrations mentioned above.

Education in Medicine and Hygiene

The Commission submitted an illuminating report on Medical Education in Brazil. As an outgrowth of this report and of the personal relations established by the Commission in Brazil, negotiations are under way looking toward a coöperative arrangement between the Board and the Sao Paulo Medical School for the establishment of a department of hygiene in that institution. The plan covers a period of five years. During this time the head of the new department will be an American sent from the United States. Two scholarships will be awarded to promising young Brazilians who will come to the United States for special training in hygiene and public health and then return to Sao Paulo to serve on the staff of the school. If the department succeeds, at the end of the five-year period the Government of Brazil will take over the undertaking and bear the entire expense, which will temporarily be met by the Board.

A scholarship arrangement has also been made with the Bello Horizonte Medical School in the State of Minas Geraes. The incumbent will come to the United States in 1917 for special study, with a view to his return to Bello Horizonte to be head of the department of pathology.

VI

ESTABLISHMENT OF SCHOOL OF HYGIENE AND PUBLIC HEALTH AT BALTIMORE

The Board, as well as other public health agencies in the United States, has been greatly handicapped in its work by the fact that hitherto there has been no school in this country prepared to give adequate training in public health. It is fundamental that the men whom the Board employs shall have had such training; that is, that before being placed in charge of work in the field, they shall not only receive a medical degree but shall be familiar with the problems in sanitary chemistry, industrial hygiene, bacteriology, protozoölogy, and kindred subjects with which the public health officer is constantly confronted.

The Executive Committee of the Board on May 27, 1915, asked that the matter be called to the attention of the General Education Board. As a consequence, the Rockefeller Foundation has established in Baltimore, in connection with the Johns Hopkins University, a School of Hygiene and Public Health. The new institution will open in October, 1917, with Dr. William H. Welch as Director and Dr. William H. Howell as head of the department of physiology. It will be closely associated with the Hopkins medical school, hospital, and school of engineering. It will offer instruction and re-

search facilities in hygiene, sanitation, and preventive medicine to medical students, engineers, chemists, biologists, and especially to men who desire to fit themselves for careers in public health.

The school will supply three urgent needs of the Board:

(1) It will furnish a body of trained men upon which the Board may draw in recruiting its field staff; and to the men who are now in the service it will offer special opportunities for additional training.

(2) It will serve as a center to which students from other countries may be sent for training in hygiene and public health, with a view to their returning to their own countries to become teachers and investigators, or to fill important positions in public health administration. The Board is prepared to coöperate with other countries, as opportunity offers, in developing public health agencies and in establishing schools and departments of hygiene in which teachers and public health workers may be trained. When the new institution at Baltimore opens in October, 1917, among its students will be enrolled a limited number of foreign students who will have been selected on the basis of availability for public health service in their native countries. It is expected that in some of the foreign countries from which such students come, facilities will be offered, in turn, to students

from the United States who may be interested in the study of tropical and other diseases.

(3) The new school will serve as a laboratory to which the Board may go for aid in solving some of the scientific problems which it meets in its work, and for specialists whom it can send out to investigate special diseases in regions where they are endemic. To the school, the Board on its side will supply a body of interesting and fresh material from tropical countries and will give opportunity for research and practical field experience. This relation of close coöperation, it is hoped, will be shared also by municipal and state departments of health and by the United States Public Health Service.

VII

INCIDENTAL ACTIVITIES

Without loss of time or expenditure of funds, and without allowing themselves to be diverted from primary undertakings, members of the staff have been able to render many incidental services which in the aggregate constitute an important contribution to the work of the year.

For example, when the Yellow Fever Commission was in Lima, Peru, the mayor of the city called the engineer of the commission into consultation concerning a new water supply system which was about to be installed. The modifications suggested provided for a more

effective installation at a lower cost than that contemplated in the original plans. As a result, the engineer was asked to supervise the installation of the plant. In response to a similar request, the commission inspected the hospitals and laboratories of Lima and gave aid in formulating a new plan of administration.

The Director for the East, in his travels during the year, was called into frequent consultation with reference to plans for tropical hospitals, the organization of health services, the making of laws and regulations for the control of leprosy, and for the treatment of persons afflicted with beriberi and yaws.

These concrete examples illustrate fields of activity in which it is hoped that greater service will be rendered in future. They all contribute toward the ultimate purpose for which the Board was established: the control of special diseases; the encouragement of the development of public health agencies; and the spread of the knowledge of scientific medicine.

II. SUMMARY OF ACTIVITIES AND RESULTS BY STATES AND COUNTRIES¹

SOUTHERN STATES

During the year 1916, work for the control of hookworm disease in the Southern States showed definite progress. The chief feature of the advance was directed against soil pollution. In this undertaking the working force was enlarged; the area of operation was extended to include the entire county; the time devoted to each county was lengthened from three or four months to approximately one year; and a program was developed which provided, within the one-year period, for definite reduction in the prevalence of hookworm disease and a marked improvement in home sanitation.

Public sentiment has backed the work. State and county appropriations show a decided increase. A movement is under way to develop the county force into a permanent department of health, ultimately to be maintained with state and county funds, and to assume responsibility not only for the completion of the work of hookworm control but for the advancement of other measures pertaining to public health.

¹ For a brief statistical interpretation of the figures included in this section of the report, see Addenda, pages 277 to 280.

Coöperative work with the Southern State Boards of Health began in 1910. For the first two years the undertaking was educational, seeking by demonstration, by illustrated lectures, by the distribution of literature, and by other means, to convince the people that hookworm disease was a reality, and that it was a serious menace to health which could and should be eradicated. In 1912, as a nucleus for this endeavor, county dispensaries were established for the free treatment of all persons who applied. The dispensaries were widely distributed at five or more points in the county, and on one day of each week for five successive weeks or longer, free clinics were held at each dispensary point. The people took advantage of this opportunity. They were urged to do so by the press, by the practicing physicians, and by teachers and influential citizens who set an example by having themselves examined.

The dispensary plan was successfully operated in over seven hundred of the more heavily infected counties. It paved the way for the intensive type of work, which, in addition to maintaining a central dispensary, carries the work into every corner of the community by a house-to-house inspection. Since the intensive plan is now in universal use throughout the South, a brief review of its development and method of operation will be given.

Development of the Intensive Plan

The first experiment in the intensive method of hookworm control was conducted in the latter part of 1913 on Knott's Island, a fishing hamlet of 567 inhabitants, located in Currituck Sound, off the extreme northeastern coast of North Carolina. Five hundred sixty persons were examined. Ninety-three were found infected and were treated. Microscopic re-examination showed that practically all of these were cured. In its effort to eradicate the infection permanently, the undertaking fell short on the sanitary side, as at the time the staff was unable to recommend a suitable type of latrine. However, the results were sufficiently encouraging to warrant similar undertakings during 1914 at various points in Virginia, North Carolina, South Carolina, and Louisiana, the four states that were first to complete the dispensary work.

The working staff in the beginning consisted of a medical officer, termed a "field director," and a trained lay assistant, termed a "microscopist" or "health inspector." These two men, by persistent effort and by confining their attention to one small rural community of five or six hundred people, could, within a period of three or four months, treat practically every infected person and secure great reduction in the degree of soil pollution. Experience showed, however, that it was not practicable to achieve one hundred per cent control in any demonstration

if ultimately the work of sanitation were to be placed on an economic basis within the reach of the average rural community. Accordingly, in 1915, further developments were introduced with a view to increased efficiency.

First, the number of health inspectors under each field director was increased to three, the object being, without enlarging overhead expense, to increase the number of people reached and the extent of territory covered by a given working staff. This provision proved so satisfactory that in 1916 the working force was again enlarged to include a field director and a sufficient number of health inspectors to cover an entire county, in approximately one year, taking the communities series by series.

By the end of 1916 the unit of working force had come to consist of a field director and five to ten health inspectors; the county had become the unit of operation; and eight months to one year had been adopted as the most satisfactory time unit for county work. In some states the field director served directly under the State Health Officer, and in others under a State Director who in turn served under the general supervision of the State Health Officer.

Present Method of Work

In conducting a campaign by the intensive plan the director who is in charge establishes an office at the county seat or at some other

point convenient to all of the communities in the series to be worked. This central office keeps financial records, distributes publicity material, makes microscopic examinations, tabulates on specially prepared blanks detailed statistics of the house-to-house sanitary survey, and prepares local maps on which are shown the homes, roads, streams, school houses, churches, and other features pertinent to the work.

The field work is done by the health inspectors, who report to the central office. They visit the people, inspect their premises, and urge changes necessary to provide each family with a latrine of a type approved by the State Board of Health. The health inspector advises as to the location of the latrine, and frequently supervises the manual labor of construction. He leaves at each home containers in which are placed the specimens of feces, which are later collected and sent to the central office for examination to determine the presence of parasites. In short, through personal contact with the people, the inspector does all in his power to further sanitation and a general knowledge of disease prevention.

Devices to Gain Coöperation

The working force has discovered many ingenious devices to gain the coöperation of the people. Two agencies brought particularly good results in the state of Mississippi in 1916. One was the publishing each week in the county

newspaper of a list of heads of families who had brought their latrines up to the standard approved by the State Board of Health. In Forrest county this list aroused local interest wherever the work was in progress. Each family wished to be recorded on the honor roll as early as possible. (See clipping, page 83.)

A second device to obtain coöperation was employed in the communities in Pearl River county, Mississippi, in which intensive work was conducted. A large, carefully prepared map giving the location of every home was posted in a conspicuous place in the community. As each householder completed the sanitary program a ring was drawn around the dot on the map which indicated his home. The map became a topic of community conversation. As the scales tipped in favor of those who had completed the work of sanitation, further delay for the remaining families became increasingly embarrassing. (See map, page 85.)

Evidence of Growing Interest in Home Sanitation

Growing interest throughout the South in hygiene and in sanitation of the home may fairly be ascribed in part to the intensive work. One notices that screening against flies and mosquitoes is gaining in popularity. It is also significant that the directors of the State Division of Morbidity Statistics in two states have mentioned an apparent reduction in the preva-

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Forrest County Leads the State in Rural Sanitation

More than Three Hundred Sanitary Closets Built at Rural
Homes in the County This Year—Below will be found
Lists of those who have Built Sanitary
Closets.

EATON GROVE COMMUNITY.

The territory in Forrest County between Leaf and Boule Rivers, Contain-
ing 176 homes.

(Whites who have built sanitary closets).

Bayliss, J. M.	Jacobs, E.	Pool, J. D.
Bayliss, R. W.	Jacobs, J. J.	Powell, Mrs.
Bayliss, G. B.	Johnson, O. R.	Quick, J. A.
Baucum, J. R.	Jones, Rev. W. F.	Richardson, B. F.
Beavers, G. B.	Knight, R. W.	Richardson, W. N.
Bishop, A.	Lee, T. F.	Richardson, L. M.
Bodman, J. F.	Lee, A. M.	Rich, C. S.
Boyce, L. B.	Lewis, B. B.	Roberts, Mrs. V. M.
Brown, W. D.	Lott, J. C.	Spencer, A. J.
Bryant, S. E.	Lovelace, O.	Steele, M. A.
Burkett, G. A.	Lovelace, L. H.	Stewart, G. W.
Chappell, J. O.	McCullough, J. W.	Strahan, A. L.
Clinton, David	McDonald, J. C.	Strahan, W. A.
Dossett, E. D.	McDonald, J. D.	Sumrall, W. A.
Edmonson, Chas.	McLemore, J. E.	Travis, J. A.
Fairchild, Mrs.	Meeks, J. C.	Travis, J. E.
Gill, M. N.	Menasco, C. R.	Travis, O. A.
Glover, J. M.	Miley, J. M.	Walls, J.
Graham, S. E.	Miller, W. D.	Watts, J. E.
Granberry, W. L.	Mixon, G. R.	Wellington, R. W.
Gray, W. R.	Montgomery, W. R.	Wilson, C. C.
Harrell, Mrs.	Nobles, F. S.	Windham, W. J.
Hobby, T. C.	Norrell, C. B.	Wright, H. B.
Holliday, M. E.	Patrick, W. J.	Young, J. M.
	Perry, L. R.	

(Colored, who have built sanitary closets).

Bishop, Isom	Ferrall, Lem	Lindsey, —
Blanks, Eli	Ferrall, Sol.	McComb, John
Boles, Edw.	Fairley, Albert	McCurdy, R.
Brown, Frank	Fairley, Joel	McCullom, S.
Byrd, Eph.	Fairley, C.	Merrill, Jim
Cameron, Jno.	Gillespie, O.	Merritt, M.
Campbell, B.	Grant, West	Miner, Albert
Carter, Quil.	Heidelberg F.	Mott, Bill
Carter Jos.	Henderson, M.	Mott, Warren
Charleston, W.	Holliman, L.	Mott, Henry
Chapman, Zack	Jones, Lizzie	Overhart, G.
Chapman, Z., Jr.	Jones, Mose	Page, Steve
Chapman, Will	Kelly, Taft	Powell, Gip
Craft, Nathan	Kelly, Horace	Travis, Leroy
Dahmer, O. W.	Kelly, Elbert	Travis, Levi

Extract from Hattiesburg, Miss., Tribune, giving list of homes in Forrest
county at which improved latrines have been built.

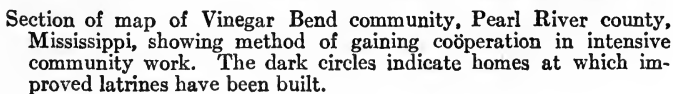
lence of typhoid fever and also of dysentery and diarrhea in the areas in which intensive sanitary work has been conducted. The incidence of these diseases in the areas worked, as compared with their incidence elsewhere, would have to be observed for a large number of communities and for a long time to warrant drawing definite conclusions, but these statements are worthy of mention.

The progress of State Health Officers in securing increased appropriations from states and counties for the enlargement of their health programs, of which the intensive work for hookworm control is one phase, also affords gratifying evidence of greater public appreciation of health measures in general.

Resulting Permanent Agencies

Still another and even more significant outgrowth is the fact that the demonstrations are creating among the people a demand for permanent agencies to continue and enlarge the work. The first definite development in this direction occurred in North Carolina. It provides that each of ten counties undertake a definite health program for a three-year period. The work outlined for the control of soil pollution diseases will consume the major portion of the first year. Gradually, the staff will be converted into a county health department and the program expanded.

CHAILLOS CROSS, M. D., Director in Charge.



For the support of the undertaking each county will pay 50 per cent of the cost for the first year and a larger amount in succeeding years. The remainder of the expense during the three-year period will be shared equally by the North Carolina State Board of Health and the International Health Board.

Measurable Reduction in Infection Secured by Dispensary Method

Under the dispensary plan of work, because of the brevity of the campaign, it was exceedingly difficult to obtain concrete information as to the degree to which hookworm disease was controlled. The four to eight weeks during which work was carried on in a given county was too short a period to admit of adequate re-examination of persons who had been treated. The intensive method has been used in fifty-five counties, in thirty-five of which the dispensary method was formerly employed. The following figures are significant:

In these thirty-five counties, 63,882 persons were examined by the dispensary plan. Of these, 37.5 per cent were found to be infected with hookworm disease. At the beginning of the intensive work in the same areas, usually from three to five years after the completion of the dispensary work, 34,727 persons were examined. The infection was found to be 26.5 per cent. Thus, in spite of the opportunities

offered over a period of years for cases of new infection or re-infection to arise, it will be seen that the infection recorded in intensive work was 11.0 per cent lower than that recorded in dispensary work, indicating that as a result of the dispensary work the number of persons infected with the disease was reduced approximately one third. The method of comparison may be open to error; the number of persons examined and the per cent of decrease are, however, sufficiently large to be significant. A more limited comparison, including only persons who were examined by both methods, indicates that the estimate of reduction is conservative. Practicing physicians and field directors state, moreover, that they now encounter but few of the severe cases of infection which were so frequently seen in 1910 and 1911.

Sufficient time has not yet elapsed since the adoption of the intensive method to warrant a tabulation of the percentage of reduction in infection which it has secured. It can reasonably be estimated, however, that this percentage is greater than that secured by the dispensary method. The intensive type of work, like the dispensary, reduces infection through curative measures. In addition, by the installation of latrines, it seeks to prevent the further spread of disease through soil pollution. It is also leading up to the establishment of permanent local agencies which guarantee the necessary system

of inspection. By its means it is reasonable to hope that new infections and re-infections will be reduced to a minimum, and that as a result hookworm disease in course of time will disappear.

Comparison of the Two Methods

The intensive type of work, which involves the installation, use, and maintenance of adequate latrines, while it produces more permanent results than the dispensary type, is nevertheless more difficult of operation than measures directed mainly to the treatment and cure of infected persons and the education of the people. It demands of the population itself a positive contribution. In most cases it requires the purchase of building material and the expenditure of time and energy to build latrines. More than this, it necessitates the arousing of a sanitary sense and a change of personal habits that will lead the people to use and maintain the latrines once built, and calls for more intimate contact with the people, more persistent and protracted effort, and a more marked faculty of leadership by the director in charge.

Increase in State Health Funds

In 1910, the legislatures of the eleven states, Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia, appro-

priated \$216,195 for health work. In 1915, the same eleven states appropriated \$512,300, an increase of 136 per cent. The present state appropriations are much larger. The funds available in North Carolina for health work, for example, have grown from approximately \$12,500 to more than \$150,000. The state health funds for South Carolina have increased from \$24,000 in 1910 to more than \$75,000 at present.¹ A similar increase is seen in other states.

Increased Budgets for Intensive Work

While the intensive work was in the experimental stage, it was financed by the International Health Board. When its feasibility had been demonstrated, and as a result the working area had been enlarged, the state and county began to assume a portion of the expense. As soon as it had been demonstrated in a few countries that the enlarged program, when carried out on a coöperative basis, was within the reach of the people, local contributions toward its maintenance increased. Subsequent growth in the size of the working staff for each base unit has been almost entirely due to increased appropriations by state and county.

In the work conducted in 1916,² for instance, the Board's proportion of the total expense throughout the South was about 50 per cent.

¹ March, 1917.

² For statistical results see pages 94 to 99.

The remaining 50 per cent was shared by state and county. In the budgets which are being developed for 1917,¹ local agencies furnish from 50 to 75 per cent. The tendency is toward a working arrangement by which the county provides 50 per cent, the State Board of Health 25 per cent, and the International Health Board 25 per cent.

The state budgets which are being developed for 1917 show large increases in appropriations for intensive work on the county plan. North Carolina, as one phase of its health program, has developed a budget for the current year in excess of \$75,000 for this purpose. Of the total amount the state pays 25 per cent, the counties 50 per cent, and the International Health Board 25 per cent. The South Carolina budget for 1917 has developed an appropriation amounting to more than \$25,000 on a similar coöperative plan. Of the amount, the state pays \$9,650, the counties \$6,000, and the International Health Board \$9,650. A somewhat larger budget is provided by Tennessee. The state pays \$10,000, the International Health Board \$10,000, and the counties the remaining amount. Texas has appropriated \$70,000 for intensive work during the biennial period beginning June 20, 1917, with the provision that the money is to be used, in coöperation with counties and other agencies, in an effort to eradicate soil pollution

¹ March, 1917.

diseases and malaria. The portion of the appropriation to be used for work in which the International Health Board coöperates is approximately \$17,000 yearly, and the total budget for intensive work is in excess of \$45,000. Toward this sum the counties contribute \$12,000. The remainder is shared equally by the state of Texas and the International Health Board.¹

Progress in State Work

Since 1910 the State Health Officers of eleven Southern States have obtained for varying periods more or less coöperation from the International Health Board and its predecessor, the Rockefeller Sanitary Commission. Generally, such assistance has taken the form of financial aid in the working programs against hookworm disease and other soil pollution diseases. In other cases it has been the temporary loan of a man to carry out a health demonstration, a state director, a field director, or an investigator to make a special study and recommend a working plan for the solution of a definite problem. The temporary association of such men with the state officials has been uniformly congenial and the results mutually satisfactory.

As has been said, the State Health Officers have obtained from state and county increased

¹ The enlarged programs were projected in 1916, but the state appropriations were not increased to the points mentioned until the early months of 1917, shortly before this report reached the press.

appropriations. In enlarging their staff they are endeavoring to establish a high standard of eligibility, and to have tenure of office and promotion rest solely on efficiency. The tendency is to have new members take a course of practical field training the better to fit them for the work they are to do. Special training bases for men who are to engage in the intensive county work, for example, have been established in Wilson county, North Carolina, and in Jones county, Mississippi.

The International Health Board is utilizing these training bases to give new members of its field staff a few months of practical experience as a preliminary to their training period in a foreign country. This practical training has proved invaluable to men who formerly were engaged in the practice of medicine, or who, on completing their medical education, have assumed the responsibilities of health officers.

The Outlook

The above developments point to a growing public interest in health work and to increased efficiency in its administration. As a field, preventive medicine is coming to be regarded as affording a useful career to efficient men. The tendency is toward more liberal compensation, greater security in tenure of office, and increased authority. The degree to which these features are emphasized will determine the at-

tractiveness of the field for young physicians of the highest type, and this, in turn, will greatly influence the progress that will be made in the control of preventable diseases.

Fortunately, the outlook is very promising for more money and men, greater efficiency and larger results, less sickness, fewer deaths, and increased economic and social development.

TABLE 1: *Southern States—Intensive Work: Homes Provided with Latrines of Approved Type, During Progress of Work, in Communities Completed from May 1, 1914, to December 31, 1916*

With Comparison of Figures for Communities Completed During 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	20,515	....	12,078	....	8,437	....
2. Homes Provided With Latrines of Approved Type: ¹						
1) First Inspection ²	555	2.7	306	2.5	249	3.0
2) Last Inspection.....	12,337	60.1	7,052	58.4	5,285	62.6
3. Homes Provided With New Latrines..	4,939	24.1	2,376	19.7	2,563	30.4

¹ These are latrines which, when inspected, have at least approximated the minimum requirements of the respective State Boards of Health as a safeguard against soil pollution.

² The first inspection is made at the time the intensive work in the community begins; the last inspection is made when the work ends.

TABLE 2: *Southern States—Intensive Work: Homes Provided with Latrines of Approved Type, During Progress of Work, in Communities Completed During 1916, by States*

	TOTAL		MISSISSIPPI		SOUTH CAROLINA		TENNESSEE		TEXAS		VIRGINIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	12,078	.....	1,287	....	2,299	....	2,797	....	866	....	4,829	....
2. Homes Provided With Latrines of Approved Type:												
1) First Inspection.....	306	2.5	49	3.8	10	.4	8	.3	.....	.....	239	4.9
2) Last Inspection.....	7,052	58.4	1,120	87.0	1,367	59.5	762	27.2	591	68.2	3,212	66.5
3. Homes Provided With New Latrines.....	2,376	19.7	575	44.7	578	25.1	515	18.4	273	31.5	435	9.0

TABLE 3: Southern States—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Communities Completed from May 1, 1914, to December 31, 1916

With Comparison of Figures for Communities Completed During 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	97,973	....	55,235	....	42,738	....
2. Examined.....	49,509	50.5	22,169	40.1	27,340	64.0
3. Found Infected.....	11,308	22.8	4,569	20.6	6,739	24.6
4. Given First Treatment ..	10,587	93.6	4,544	99.5	6,043	89.7
5. Cured.....	2,815	26.6	1,231	27.1	1,584	26.2

TABLE 4: *Southern States—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Communities Completed During 1916, by States*

	TOTAL		MISSISSIPPI		SOUTH CAROLINA		TENNESSEE		TEXAS		VIRGINIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	55,235	....	5,730	....	11,431	....	12,749	....	4,168	....	21,157	....
2. Examined.....	22,109	40.1	3,780	66.0	6,665	58.3	1,217	9.5	2,801	67.2	7,706	36.4
3. Found Infected.....	4,509	20.6	1,466	38.8	1,991	29.9	49	4.0	570	20.3	493	6.4
4. Given First Treatment..	4,544	99.5	1,455	99.2	1,980	99.4	48	93.0	568	99.6	493	100.0
5. Cured.....	1,231	27.1	403	27.7	292	14.7	8	16.7	357	62.9	171	34.7

TABLE 5: *Southern States—Intensive Work: Number of Pieces of Literature Distributed During 1916, by States¹*

CLASS OF LITERATURE	Total	Mississippi	Tennessee	Virginia
Total	54,334	8,322	14,091	31,921
Letters	10,938	372	2,485	8,081
Pamphlets	16,293	1,980	6,556	7,757
Leaflets	11,974	4,950	4,945	2,079
Notices and Bulletins	15,129	1,020	105	14,004

¹ The distribution of literature during 1916 was not reported by South Carolina and Texas.

TABLE 6: *Southern States—Intensive Work: Number of Lectures Delivered During 1916, with Attendance, by States*

	Total	Mississippi	South Carolina	Tennessee	Texas	Virginia
1. Total Lectures.....	705	6	16	202	30	451
1) Public.....	532	2	16	152	29	333
2) School.....	150	3	..	46	1	100
3) Special.....	23	1	..	4	..	18
2. Attendance at Lectures . . .	43,623	448	.. ¹	15,747	695	26,733
1) Public.....	30,511	300	..	11,050	669	18,501
2) School.....	12,076	118	..	4,545	35	7,378
3) Special.....	1,036	30	..	152	..	854

¹ The attendance at lectures in South Carolina was not reported.

ANTIGUA

In Antigua the measures for the relief and control of hookworm disease are conducted under the supervision of Dr. M. P. Duke, the Chief Government Medical Officer. The intensive plan is followed. The staff engaged in the curative work consists of two microscopists, four nurses, two assistant nurses, one clerk, and one caretaker, acting under the direction of Dr. Don Morse Griswold.¹ Since May 15, 1916, the Government of Antigua has employed a special sanitary inspector to advance the measures of sanitary reform. Headquarters are at St. Johns, the capital.

The unit of operations is a group of villages. Excluding St. Johns, with its population of 8,000, the people of the Island, about 85 per cent of whom are full-blooded negroes, live mainly in rural villages and engage in agriculture. Sugar is the principal crop. For the purposes of the work, the Island has been divided into six areas. On account of the sparsity of the population, these areas have been made as large as can be conveniently handled from a central point. From the inauguration of the work on September 15, 1915, up to December 31, 1916, work had been completed in three of these areas, and was in progress on December

¹ On March 8, 1916, Dr. Griswold succeeded Dr. P. W. Covington as Director. During the period from December 7, 1915, to March 8, 1916, Dr. Harold Leslie Kearney served as Acting Director.

31, 1916, in a fourth. All four of these districts lie in the southern half of the island, where the population is most dense.

The first area in which operations were undertaken (York Valley) occupied the southwestern portion of the colony. This, with the second area (Belvidere), just to the east, was bounded on three sides by high hills and mountains. Both districts included all the villages within a radius of three miles. The Belvidere area had a population of only 884, but the high hills surrounding it prevented the inclusion of any additional villages. The third area, known as the All Saints, adjoined the Belvidere district on the east, and had the largest population of any of the areas completed by the end of the year.

Examination and Treatment

The population of the three areas in which work had been completed up to December 31, 1916, was 7,565. Of this total population, the staff examined 7,477, or 98.8 per cent, for hookworm disease; and found 2,229, or 29.8 per cent, of those examined to be infected. First treatment was administered to 2,054, or 92.1 per cent, of those infected; and 1,973, or 96.1 per cent of those given first treatment, were cured.

In Table 1 these figures are presented, along with a comparison of the results accomplished in the three areas completed during 1916.¹

¹No areas were completed during 1915.

TABLE 1: *Antigua—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from September 15, 1915, to December 31, 1916*

	TOTAL		YORK VALLEY		BELVIDERE		ALL SAINTS	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	7,565	....	1,957	....	884	....	4,724	....
2. Examined.....	7,477	98.8	1,943	99.3	860	97.3	4,674	98.9
3. Found Infected.....	2,229	29.8	531	27.3	254	29.5	1,444	30.9
4. Given First Treatment.....	2,054	92.1	471	88.7	241	94.9	1,342	92.9
5. Cured.....	1,973	96.1	450	95.5	219	90.9	1,304	97.2

It will be seen from Table 2 that of the 2,229 persons originally found infected, only 8.5 per cent remained as possible foci of infection when operations within the three districts had been completed. Almost all of those who were not cured during the progress of the work were persons from whom treatment had to be withheld for medical reasons: they represented 6.4 per cent of those infected. Persons who refused to be cured numbered only 1 per cent of the total infected. In the All Saints district, as the table shows, the percentage of persons remaining uncured was smaller than in either of the other two districts. (See Table 2, page 104.)

Table 3 presents in detail the results of the work of examination and treatment in the York Valley, Belvidere, and All Saints districts. In this table are included the supporting figures upon which Tables 2 and 3 are based. (See Table 3, page 105.)

Educational Work

In each area in which operations are conducted, public lectures, accompanied by projection-lantern slides, are given in the evening; and talks in the school-rooms, illustrated by a chart on hookworm disease, are given in the afternoon. The plan adopted is to give these lectures at various places in the districts until the total attendance at all of the lectures is approximately the same as the population of the dis-

TABLE 2: *Antigua—Intensive Work: Number of Persons Remaining Uncured in Areas Completed from September 15, 1915, to December 31, 1916, by Areas*

	TOTAL		YORK VALLEY		BELVIDERE		ALL SAINTS	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected	2,229	....	531	....	254	....	1,444	....
2. Cured.....	1,973	88.5	450	84.7	219	86.2	1,304	90.3
3. Removed.....	67	3.0	27	5.1	7	2.8	33	2.3
4 Remaining in Area Uncured.....	189	8.5	54	10.2	23	11.0	107	7.4
1) Not located.....	14	.6	....	....	3	1.2	11	.8
2) Refused.....	24	1.1	10	1.9	4	1.6	10	.7
3) Medical Reasons.....	143	6.4	36	6.8	21	8.3	86	6.0
4) Under Treatment.....	8	.4	8	1.5	....	....	....	....

TABLE 3: *Antigua—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed from September 15, 1915, to December 31, 1916, by Areas*

	Total	York Valley	Belvidere	All Saints
1. Census.....	7,565	1,957	884	4,724
2. Examined	7,477	1,943	860	4,674
3. Not Examined.....	88	14	24	50
1) Not Located.....	6	..	3	3
2) Refused.....	28	14	9	5
3) Removed.....	44	..	11	33
4) Insane.....	2	..	1	1
5) Died.....	8	..	..	8
4. Found Infected.....	2,229	531	254	1,444
5. Given First Treatment	2,054	471	241	1,342
6. Not Given First Treatment.	175	60	13	102
1) Not Located.....	10	..	1	9
2) Refused.....	12	5	1	6
3) Medical Reasons....	112	36	10	66
4) Removed.....	37	17	1	19
5) Died.....	4	2	..	2
7. Cured.....	1,973	450	219	1,304
8. Given First Treatment but Not Cured.....	81	21	22	38
1) Not Located.....	4	..	2	2
2) Refused.....	12	5	3	4
3) Medical Reasons....	31	..	11	20
4) Removed.....	24	7	6	11
5) Died.....	2	1	..	1
6) Under Treatment ...	8	8	..	..

trict. At two of the most important meetings, His Excellency the Acting Governor and His Lordship the Bishop presided. The attendance at all has been exceptionally good.

The number of lectures delivered in the various areas up to December 31, 1916, with the estimated attendance, is shown in Table 4.

TABLE 4: *Antigua—Intensive Work: Number of Lectures Delivered in Areas Completed from September 15, 1915, to December 31, 1916*

	Total	York Valley	Belvidere	All Saints
1. Total Lectures.....	29	16	4	9
1) Public.....	13	4	2	7
2) School.....	5	1	2	2
3) Special.....	11	11	..	..
2. Attendance at Lectures	8,570	1,720	850	6,000
1) Public.....	6,900	1,250	650	5,000
2) School.....	1,270	70	200	1,000
3) Special.....	400	400	..	..

At every home, circulars describing hookworm disease and handbills announcing the dates of lectures are delivered; and a copy of the progress report which appears in the Official Gazette of the Antiguan Government is mailed monthly to each of the district medical officers, clergymen, planters, and other influential persons throughout the colony, as a means of keeping them informed concerning the work.

Sanitary Improvement

The native rural population of Antigua is almost entirely without latrine accommodations. In the three areas in which the work of examination and treatment had been completed up to

December 31, 1916, for instance, the sanitary inspection showed that only 38 among a total of 1,830 homes were provided with latrines. The task of securing the installation of latrines at rural homes is therefore one of the most pressing problems of the local Government.

The special sanitary inspector appointed by His Excellency the Acting Governor, has been actively engaged in this work since May 15, 1916. Up to the end of the year, 32 additional homes had been provided with latrines,—15 in the York Valley and 17 in the Belvidere district. In the All Saints district, efforts at sanitary reform were also in progress, but no definite figures have been reported. In all of these areas the sanitary work will be continued until a far larger proportion of the homes has been provided with latrines.

BRITISH GUIANA

The work conducted by the Government of British Guiana for the relief and control of hookworm disease continued during 1916 under the direction of the Surgeon General, Dr. K. S. Wise. On July 1, 1916, Dr. F. W. Dershimmer succeeded Dr. F. E. Field as Supervising Medical Officer. The intensive plan was followed. Measures of sanitary reform remained in the hands of a staff of native inspectors maintained by the Government.

The bulk of the population of the colony lives in a narrow strip of land along the northern coast. With the exception of a few habitations extending inland for a short distance along the larger rivers, this represents practically the only inhabited area. The land is low-lying, flat, and swampy, and is used almost entirely for cane cultivation and rice-growing.

Of the total population of the colony, numbering approximately 296,000 persons, about one-fourth live on the sugar estates. The remainder are grouped in towns and villages, there being few isolated houses. Approximately 42 per cent of the inhabitants are East Indians and 39 per cent negroes. A large variety of races and religions are included in the other 19 per cent.

From the beginning of the work on March 12, 1914, up to December 31, 1916, operations had been completed in three areas: Peter's Hall,

Belle Vue, and Plaisance. The first extends for a distance of eight miles along the east bank, and the second for a distance of fourteen miles along the west bank, of the Demerara river. The results accomplished in these areas were included in the annual report for 1915.

In the Plaisance area, the only area completed during 1916, the work had been begun on October 1, 1915. It was completed on September 30, 1916. Operations were then begun in another area, but since the work in this fourth area had not been completed by December 31, 1916, the results accomplished in it are omitted from this report.

Headquarters for the Plaisance area were established in the village of that name, located near the center of the area, with field offices in each of the four districts into which the area was divided. Each field office had its staff of nurses and distributors, and a caretaker. Early in the work the total force employed in the field, exclusive of the home office, numbered sixty-two men. This was found too large for effective supervision, and was gradually reduced until, towards the close of the campaign, only ten nurses, twelve distributors, and four caretakers, or twenty-six persons in all, remained.

The area, with a population of 18,951, extends eastward along the northern coast for a distance of twelve miles from Georgetown, the capital. Its width varies from one to three

miles. The land is flat, and at high tide lies several feet below sea-level. Dikes have been built to keep out the sea. Drainage is carried out by an elaborate system of canals, from which the water escapes at low tide through gates in the sea wall. Certain of the canals are used for drainage and sewerage; others furnish water for drinking and culinary purposes. During the rainy season, the drainage is sometimes inadequate and large areas are flooded. Storms often batter down the sea walls, and until the break is repaired large areas are flooded with salt water at each succeeding high tide.

The rice-growing industry, spreading rapidly in this area, has resulted in the formation of numerous ponds of shallow water. In these, as well as in the trenches which have become choked with vegetation, mosquitoes breed in large numbers. Throughout the area malaria is prevalent to a marked degree.

Huts of from one to three rooms, built either of mud, thatched with palm leaves or straw, or of wood, house the majority of the people. Many of these huts have dirt floors. During the rainy season the yards are often covered with water and the houses built on the ground are flooded.

Examination and Treatment

The total population of the three areas in which work had been completed up to December 31, 1916, was 41,274,—approximately one-

seventh of the total population of the colony. Of these 41,274 persons, 39,568, or 95.9 per cent, were examined for hookworm disease; and 22,943, or 58.0 per cent of those examined, were found infected. First treatment was administered to 20,166 persons, representing 87.9 per cent of those infected; and 16,264, or 80.7 per cent of those receiving first treatment, were cured.

In Table 1 figures are presented separately for the results accomplished in the areas completed during 1915 and 1916. The statistics for 1915 include the combined results in the Peter's Hall and Belle Vue districts, both of which were completed in that year; those for 1916 are for the Plaisance area only.

TABLE 1: *British Guiana—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from March 12, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916¹

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	41,274	....	18,951	....	22,323	....
2. Examined.....	39,568	95.9	18,498	97.6	21,070	94.4
3. Found Infected.....	22,943	58.0	9,808	53.0	13,135	62.3
4. Given First Treatment.....	20,166	87.9	8,263	84.2	11,903	90.6
5. Cured.....	16,264	80.7	6,225	75.3	10,039	84.3

¹No area was completed during 1914.

It will be seen that for the Plaisance area the percentage of persons infected and the percentage of persons cured was lower than the average for the two areas previously completed. The decrease in the percentage of persons cured may be explained by the fact that the East Indians engaged in the rice-growing industry spend, during the planting and harvesting seasons, seven long days each week in the fields, and as a rule will not give even one day for treatment. Two crops are raised each year, so that there are four or five months during which a large part of the population can hardly be reached. The rice fields, furthermore, are kept submerged until just before the harvest, and many of the people believe that if they go into the water within a day or two after taking salts they will catch cold, and so lose not one but two or three days from their labor.

Table 2 exhibits the thoroughness of the work in reducing the number of persons remaining as foci of infection. As will be noted, 2,122 of the 9,808 persons originally found infected, or 21.6 per cent, remained in the area uncured at the close of the work. The largest single group (902) of these uncured persons included those who had taken one or more treatments but had not been found cured on re-examination. These persons, representing 9.2 per cent of those infected, are classed as under treatment. The persons who could not be treated for medical reasons or who refused treatment, formed, re-

spectively, groups including 6.0 and 6.5 per cent of the total found infected.

TABLE 2: *British Guiana—Intensive Work: Number of Persons Remaining Uncured in Area Completed During 1916*

	TOTAL FOR 1916	
	Number	Per Cent
1. Infected.....	9,808	....
2. Cured.....	6,225	63.5
3. Removed.....	1,461	14.9
4. Remaining in Area Uncured.....	2,122	21.6
1) Refused.....	633	6.5
2) Medical Reasons.....	587	6.0
3) Under Treatment.....	902	9.2

Table 3 presents in detail the figures covering the results of examination and treatment in the Plaisance area. (See Table 3, page 114.)

Educational Work

The same educational features were employed in the Plaisance as in the Peter's Hall and Belle Vue areas. There was an inaugural meeting attended by prominent officials and citizens, and other public meetings were held from time to time throughout the area. During the progress of the work twenty-six lectures were delivered to a total attendance estimated at 5,947. Ten of these lectures were to the public and sixteen to school children.

TABLE 3: *British Guiana—Intensive Work: Detailed Results of Examination and Treatment in Area Completed During 1916*

	Total for 1916
1. Census	18,951
2. Examined	18,498
3. Not Examined (not located)	453
4. Found Infected	9,808
5. Given First Treatment	8,263
6. Not Given First Treatment	1,545
1) Removed	767
2) Refused	191
3) Medical Reasons	587
7. Cured	6,225
8. Given First Treatment but Not Cured	2,038
1) Removed	670
2) Refused	442
3) Died	24
4) Under Treatment	902

A summary of the educational work by lectures, as conducted in the areas completed up to December 31, 1916, is presented in Table 4. (See Table 4, page 115.)

Table 5 indicates that in the Plaisance area 6,164 pieces of literature were distributed, of which 6,029 were pamphlets and 135 were posters. (See Table 5, page 115.)

Sanitary Improvement

The three areas in which the work of examination and treatment had been completed up to

TABLE 4: *British Guiana—Intensive Work: Number of Lectures Delivered from March 12, 1914, to December 31, 1916, with Attendance*

With Comparison of Figures for 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
1. Total Lectures	68	26	42
1) Public	35	10	25
2) School	27	16	11
3) Special	6	..	6
2. Attendance at Lectures . .	15,858	5,947	9,911
1) Public	8,986	4,124	4,862
2) School	3,257	1,823	1,434
3) Special	3,615	.....	3,615

TABLE 5: *British Guiana—Intensive Work: Number of Pieces of Literature Distributed from March 12, 1914, to December 31, 1916, by Classes*

With Comparison of Figures for 1915 and 1916

CLASS OF LITERATURE	Up to December 31, 1916	During 1916	During 1915
Total	18,171	6,164	12,007
Pamphlets	16,367	6,029	10,338
Posters	1,784	135	1,649
Not Classified	20	....	20

December 31, 1916, included a total of 11,047 homes. When the work of examination and treatment was begun, 4,933 of these homes, or 44.7 per cent, were found to be provided with latrines, as compared with 6,382, or 57.8 per cent, when the work of examination and treat-

ment ended. During the progress of the work, therefore, 1,449 additional homes were provided with latrine accommodation. These figures are shown in Table 6.

TABLE 6: *British Guiana—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed from March 12, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected....	11,047	....	4,900	....	6,147	....
2. Homes with Latrines:						
1) First Inspection	4,933	44.7	2,409	49.2	2,524	41.1
2) Last Inspection	6,882	57.8	2,464	50.3	3,918	63.7
3. Homes Provided with New Latrines.....	1,449	13.1	55	1.1	1,394	22.7

The figures in this table do not include all of the sanitary work undertaken nor all of the results accomplished. In addition to securing the installation of latrines at homes where none have previously existed, the inspectors endeavor to have old latrines improved and made sanitary, main and interlot drains cleaned out, unnecessary vegetation removed, and other measures of sanitation introduced; and this work often continues in an area for months after the population has been examined and treated. In the Peter's Hall and Belle Vue districts, for in-

stance, which are represented in the table by the figures for 1915, it is shown that only 63.7 of the homes were provided with latrines when the curative work ended. A recent report states that as a result of the active campaign waged by the Government sanitary inspectors, practically every home in these districts has been provided with an approved latrine, and a tour of inspection made by the Surgeon General and the Supervising Medical Officer showed that every latrine was being used. In addition, houses have been razed in overcrowded districts, and measures against mosquitoes, such as the removal of underbrush from the vicinity of houses and the improvement of drainage, have been employed.

In the Plaisance area, the table shows that there were only 55 additional homes provided with latrines during the progress of the work of examination and treatment. In this area it had been planned to have the sanitary work completed before the curative work was begun, but a lack of funds prevented this, and a start was not made until the curative work was well under way. Unfortunately, however, the villagers objected to the enforcement of sanitary laws and refused to take further treatment unless the inspectors were withdrawn. This was done, with the result that conditions in the area remained practically unimproved while the people were being examined and treated.

Although the failure to effect the needed sanitary improvement in this area during the progress of the work was a disappointment, the delay was merely temporary, steps are now being taken to enforce the sanitary regulations, and the Surgeon General promises that most of the necessary latrines will be erected within a few months. The Government authorities are now carrying out advance measures for the sanitary improvement of areas into which the curative work is shortly to be introduced.

The interest which the Government, the District Medical Officers, and the estate owners are manifesting in efforts to banish the disease from the colony is reflected in the fact that in the three public hospitals, and in most if not all of the estate hospitals, every patient admitted is examined for hookworm disease without regard to the complaint for which he enters. If found infected, effort is made to cure him before he is discharged. On many of these estates, furthermore, the indentured laborers are being systematically examined and treated under the supervision of the District Medical Officers.

As a means of reducing the amount of sickness in certain localities, the value of well-directed efforts at sanitary improvement, taken in conjunction with the treatment and cure of sufferers from hookworm disease, is suggested by the figures in Table 7. This table shows the number of persons admitted to the public hospital at

Georgetown during the years 1914, 1915, and 1916. From the Peter's Hall and Belle Vue districts, in which operations against hookworm disease were in progress, respectively, from March 12, 1914, to March 31, 1915, and from January 9, 1915, to September 30, 1915, it will be seen that the number of patients admitted during 1916 was 31.5 per cent lower than the number admitted during 1914. In contrast with this, the table shows that from the districts in which measures against hookworm disease were not conducted, exclusive of the city of Georgetown, the percentage of reduction in admissions

TABLE 7: *British Guiana: Number of Patients Admitted to Public Hospital at Georgetown from Districts in which Work Against Hookworm Disease Was Conducted, Compared with Number Admitted from Districts in which Work Was Not Conducted—Years 1914, 1915, and 1916*

	NUMBER OF ADMISSIONS			Per Cent of Reduction— 1916 Compared with 1914 ¹
	During 1914	During 1915	During 1916	
Areas in which Work Was Conducted:				
Total.....	1,457	1,018	998	31.5
Peter's Hall.....	929	625	606	34.7
Belle Vue.....	528	393	392	25.8
Areas in which Work Was Not Conducted:				
Total.....	6,964	6,950	7,518	+ 8.0
Total Excluding City of Georgetown.....	2,215	2,147	2,072	6.5
City of Georgetown.....	4,749	4,803	5,446	+14.7

¹A plus sign denotes per cent of increase.

was only 6.5; while from the city of Georgetown the number of patients admitted was 14.7 per cent higher in 1916 than in 1914. (See Table 7, page 119.)

DUTCH GUIANA

The work for the relief and control of hook-worm disease in Dutch Guiana follows the intensive plan and provides for two separate staffs, one concerned with remedial and the other with preventive measures. The first staff is maintained by the Board, the second by the Government. Both are under the supervision of the Surgeon General, Honorable A. L. Schenck.

During 1916, the remedial measures have remained under the direction of Dr. W. H. Kibler, who serves as State Director. From October 15, 1915, the date on which the work in Dutch Guiana was inaugurated, until March 15, 1916, his staff consisted of eight persons, including two microscopists, four nurses, one clerk, and one caretaker. From March 15 to December 31, 1916, from nineteen to twenty-one persons were employed, consisting of three microscopists and twelve nurses, and, at different times, three or four clerks and one or two caretakers.

The entire population of Dutch Guiana lives in a strip of coastal plain, or mud flat, lying along the northern coast and extending inland a distance of about fifty miles. Paramaribo, the capital, with a population of 40,000, and about 155 estates and settlements having a population of more than 50 persons each, are included within this plain. The total population of the 155 estates and settlements, excluding Paramaribo,

is 38,055. For the purpose of the work, each estate or settlement forms a separate unit. On twelve of these estates and in one of these settlements, all lying along the Commewyne river in what is known as the Lower Commewyne area, operations were brought to a close during the year 1916. The total population of these estates and this settlement was 4,470 persons, composed mainly of East Indians and Javanese in about equal numbers, with approximately 500 creoles. Full-blooded whites and negroes were not numerous.

Examination and Treatment

Of the total of 4,470 persons inhabiting the area in which operations were completed during 1916, the staff succeeded in examining 4,411, or 98.7 per cent, for hookworm disease. The number found infected was 3,900, or 88.4 per cent of those examined. First treatment was administered to 3,667 persons, representing 94.0 per cent of those found infected; and 3,233, or 88.2 per cent of those receiving first treatment, were cured. Table 1 presents these figures in tabular form. (See Table 1, page 123.)

Treatment is administered under hospital conditions. For this purpose, accommodations in the hospital located on each estate are provided by the estate owners.

Table 2 illustrates the effectiveness of the work in reducing the number of infected persons in the area. It will be seen that of the 3,900 persons

TABLE 1: *Dutch Guiana—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916*

	TOTAL FOR 1916	
	Number	Per Cent
1. Census	4,470	....
2. Examined	4,411	98.7
3. Found Infected	3,900	88.4
4. Given First Treatment	3,667	94.0
5. Cured	3,233	88.2

originally found infected, only 337, or 8.6 per cent, remained in the area uncured at the close of the work. More than half of these were persons who could not be cured for medical reasons. Those who refused to be treated numbered less than 1 per cent of the total infected.

TABLE 2: *Dutch Guiana—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916*

	TOTAL FOR 1916	
	Number	Per Cent
1. Infected	3,900	....
2. Cured	3,233	82.9
3. Removed	330	8.5
4. Remaining in Area Uncured	337	8.6
1) Refused	33	.8
2) Medical Reasons	202	5.2
3) Under Treatment	102	2.6

In Table 3 are given the detailed figures upon which Tables 1 and 2 are based. This table gives full particulars of the work of examination and treatment.

TABLE 3: *Dutch Guiana—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916*

	Total for 1916
1. Census.....	4,470
2. Examined.....	4,411
3. Not Examined.....	59
1) Not Located.....	10
2) Refused.....	16
3) Removed.....	33
4. Found Infected.....	3,900
5. Given First Treatment.....	3,667
6. Not Given First Treatment.....	293
1) Refused.....	5
2) Medical Reasons.....	150
3) Removed.....	77
4) Died.....	1
7. Cured.....	3,233
8. Given First Treatment but Not Cured.....	434
1) Refused.....	28
2) Medical Reasons.....	52
3) Removed.....	246
4) Died.....	6
5) Under Treatment.....	102

Educational Work

In an attempt to acquaint the people of Dutch Guiana with the symptoms, harmful effects, prevalence, method of distribution, and means

of prevention of hookworm disease, several measures are pursued. A public lecture illustrated by lantern slides is given before work is begun on an estate; pamphlets printed in Dutch, Negro-English, Hindustani, and Javanese are distributed; and the nurses, in their daily contact with the people, use every opportunity to explain in simple terms the facts about the disease. On beginning the work on each estate there is a public demonstration of worms that have been recovered from persons treated on other estates. At this demonstration, charts and pictures are exhibited, and the microscope is used to show young hookworms recently hatched from the eggs. The practice, too, of counting in the presence of each patient the number of worms recovered from his stool, enlists much interest and lends strong support to the work of examination and treatment.

In the educational work in Dutch Guiana up to December 31, 1916, eleven public lectures had been delivered to a total attendance estimated at 5,000 persons, and approximately 2,000 printed pamphlets had been distributed.

Sanitary Improvement

On the first of January, 1916, a code of general sanitary regulations went into effect. In these regulations the entire extent of all plantations is considered public land, and soil pollution thereon is penalized. The district medical offi-

cers and the police, among others, are charged with their enforcement. Additional regulations, designed especially to aid the measures against hookworm disease, were presented to the Colonial Assembly on March 20, 1916, by His Excellency the Governor. These regulations require the construction, maintenance, and use of latrines in numbers sufficient to accommodate the entire population of all areas wherein operations are conducted.

The barracks, or ranges, built for the estate laborers in Dutch Guiana contain from five to twenty rooms, each room being occupied by a family of two or more persons. In the reports these separate rooms are classed as homes. One latrine may provide accommodations for the occupants of one or more ranges, and thus serve a large number of homes. The territory in which the curative work had been completed up to December 31, 1916, included 1,824 homes. Table 4 shows that when the work began, only 325, or 17.8 per cent, had latrine accommodation. During the progress of the work, accommodation was provided for 1,290 additional homes, increasing the number with latrine accommodation to 1,615, or 88.5 per cent of the total. The actual number of new latrines installed, by which accommodation was provided for the 1,290 additional homes, was 226. (See Table 4, page 127.)

TABLE 4: *Dutch Guiana—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed During 1916*

	TOTAL FOR 1916	
	Number	Per Cent
1. Homes Inspected.....	1,824	....
2. Homes Provided with Latrine Accommodation:		
1) First Inspection.....	325	17.8
2) Last Inspection.....	1,615	88.5
3. Homes Accommodated by New Latrines.....	1,290	70.7

The figures in this table, however, do not signify the real extent of sanitary reform accomplished. In addition to the new latrines installed, a number of old latrines were improved and made sanitary; the maintenance and use of all latrines was required; drainage for the laborers' quarters was secured; filth, rubbish, and unnecessary vegetation were removed. On every hand the laborers gave evidence of genuine coöperation. One manager, representing a group of estates, writes: "At first I had some doubt that the laborers would use the latrines which I was advised to build, but I find they like them and use them regularly. I think this will continue so long as the latrines are inspected and kept clean."

From all of the estates the reports received indicate that the laborers show marked improvement in general health and in working capacity following their treatment and cure for hook-

worm disease. On one estate, among five men taken at random, their average wage per working day was 34 per cent higher for the three months following treatment than it had been for the three months preceding; and on another, among six men chosen at random, their average daily wage for a period of two months after treatment exceeded by 38 per cent that for a period of three months before treatment.

GRENADA

In Grenada the work for the relief and control of hookworm disease is conducted under the direction of the Colonial Surgeon, with the assistance of a local Advisory Committee of which the Colonial Secretary is Chairman. On August 26, 1916, Dr. H. S. Colwell succeeded Dr. Angus MacDonald as Medical Officer in Charge of the curative work. The staff engaged in this work consists of one clerk, three microscopists, six nurses and assistant nurses, and two caretakers. In addition, a staff of inspectors is employed by the Government to secure the needed sanitary reform.

From the beginning of the work in Grenada on December 1, 1914, up to December 31, 1916, operations had been completed in a part of the parish of St. George known as the Mt. Moritz area, in the whole of the parish of St. David, in approximately one half of the parish of St. Andrew, and in a small area (Dougaldston) embracing two square miles in the parish of St. John. In addition, a central office was maintained in the town of St. George's, where persons who applied from any section of the Island were examined and treated. In all of the areas except Dougaldston, the work was conducted by the dispensary plan. On December 31, 1916, activities by the intensive plan were also in progress in four restricted areas in St. John's

parish: Concord, Marigot, Grand Roy, and Mt. Nesbit, which, taken in connection with the Dougaldston area completed before the end of the year, include the whole of St. John's parish south of the Dougaldston river.

In the Concord and Dougaldston areas, the work was inaugurated on February 1 and February 15, 1916, respectively; in Marigot and Grand Roy on September 9; and in Mt. Nesbit on November 28. From the first of September until the close of the year, the entire attention of the staff was devoted to the intensive work in these five areas. For this purpose, headquarters were established in the town of Grand Roy. The other eight months of the year were spent in bringing to a close the operations by the dispensary plan which had been begun during 1915 in the Mt. Moritz, St. David's, and St. Andrew's areas.

The Dougaldston area, the only area completed by the intensive plan during 1916, consists of one large cocoa estate, situated about one half mile from the town of Gouyave and about twelve miles from St. George's, the capital. The land rises rapidly from the sea-level to the high hills near the central ridge of the Island. The people, numbering about 426, are mostly negroes, with a few East Indians. About 150 are housed in barracks and another 150 live along the main road near the seacoast. The remainder have small houses scattered about the estate.

Examination and Treatment

In all of the areas in which work had been completed by either the dispensary or intensive method up to December 31, 1916, a total of 23,896 persons was examined. Of these, 15,420, or 64.5 per cent, were found infected. Due to the plan followed up to September 1, 1916, of administering treatment in certain cases on clinical diagnosis, first treatment was given to 15,669 persons,—249 in excess of the number found infected. Of those who received first treatment, 4,384, or 28.0 per cent, were cured.

Table 1 presents these figures, and offers a comparison of the results accomplished during 1916 and prior to 1916.

TABLE 1: *Grenada—Dispensary and Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from December 1, 1914, to December 31, 1916*

With Comparison of Figures for 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	23,896	....	5,312	....	18,584	....
2. Found Infected.....	15,420	64.5	4,226	79.6	11,194	60.2
3. Given First Treatment.....	15,669	....	4,147	....	11,522	....
4. Cured.....	4,384	28.0	1,038	25.0	3,346	29.0

In Table 2 the results accomplished by the dispensary method during 1916 are compared

with those accomplished by the intensive method in the one area wherein operations by the latter plan had been completed by the close of the year. The most striking contrast is shown in the percentage of persons cured: in the dispensary work this was only 20.4 per cent of the persons given first treatment, as compared with 77.1 per cent in the intensive work.

TABLE 2: *Grenada—Dispensary and Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916*

With Comparison of Figures for Results Accomplished in Dispensary and in Intensive Work

	TOTAL		DISPENSARY WORK		INTENSIVE WORK	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	....	....	....	....	426	....
2. Examined.....	5,312	....	4,886	....	426	100.0
3. Found Infected.....	4,226	....	3,885	....	341	80.0
4. Given First Treatment.....	4,147	98.1	3,807	98.0	340	99.7
5. Cured.....	1,038	25.0	776	20.4	262	77.1

Educational Work

In the areas in which intensive work was conducted from August 26 until the end of the year, two out-door lectures were held, in addition to the customary meetings in schools and churches. Occasionally, the microscopists have gone into outlying districts and given microscopic demon-

strations to the people in their homes; and in some cases the nurses have strained the stools of the patients after treatment to exhibit the worms that have been expelled. In addition, the medical officer and the nurses in their daily contact with the people have done much to spread a knowledge of the disease.

Table 3 presents a summary of the educational work conducted by means of lectures in the areas in which operations by the intensive plan were in progress during the last four months of 1916.

TABLE 3: *Grenada—Intensive Work: Number of Lectures Delivered from August 28, 1916, to December 31, 1916, with Attendance*

	Total for 1916
1. Total Lectures	9
1) Public.....	7
2) School.....	2
2. Attendance at Lectures	1,415
1) Public.....	1,275
2) School.....	140

The distribution of literature in these areas is indicated in Table 4. (See Table 4, page 134.)

Sanitary Improvement

A detailed sanitary survey was made throughout the five areas in which work was conducted during the last four months of the year. In these areas, with a population of 2,620 persons,

TABLE 4: *Grenada—Intensive Work: Number of Pieces of Literature Distributed from August 26, 1916, to December 31, 1916*

CLASS OF LITERATURE	Total for 1916
Total	1,960
Personal Letters	10
Leaflets	1,025
Pamphlets	325
Notices	600

there are 671 homes. Only 75 were found to be provided with latrines on the first inspection, and 59 of these were in the Mt. Nesbit area, which embraces two large cocoa estates and the village of Mt. Granby. In this area there are 319 inhabitants and 87 homes. The owners of the estates have provided latrines for the use of their laborers, who keep the latrines in fairly good condition. Some of the people in the village of Mt. Granby also have creditable latrines.

Throughout the other areas the homes provided with adequate sanitary accommodations number less than ten. A spot about 75 feet from the house, often on the slope of a hill directly above it, is most frequently chosen for the disposal of excrement. No attempt is made to bury the feces. Persons living near the seashore carry their utensils daily to the beach, where they exercise a varying degree of caution against emptying the contents upon the dry sand above high-water mark.

Very few of the people have shown any dis-

position to provide themselves voluntarily with latrines. There is, however, a law for compelling the installation of latrines at all homes, except where such installation might contaminate the water supply. The Advisory Committee has urged that this law be more rigidly enforced by the local authorities. The Government has also been requested to appropriate 300 pounds for sanitary improvement. A part of this sum would be used to provide dumping stations for the convenience of persons living in thickly populated districts in proximity to streams or other sources of drinking water.

At Belmont, Concord, and Grand Roy, capacious and well-constructed latrines, with concrete sides to the pit, have been constructed at the Government schools by order of His Excellency the Governor, and similar structures are in course of erection at the Government schools in other centers. The installation of these latrines at the schools will doubtless have much influence in educating the people to build and use latrines at their homes.

ST. LUCIA

Measures for the relief and control of hook-worm disease in St. Lucia continued during 1916 under the supervision of Dr. Stanley Branch. On June 19, 1916, the functions of the Advisory Committee, which had been appointed by the Island Government to direct the work, were vested in the Board of Health of the Colony. At that time, two influential landed proprietors were added to the Board. The Administrator is Chairman.

Beginning January 1, 1916, a strictly intensive plan of work was followed. In preparing specimens for microscopic examination the centrifuge was used, and in administering treatment the nurses were required to see that the patients swallowed each dose. Throughout the year, two microscopists, four nurses, and a clerk were engaged in the work of examination and treatment, with a special field inspector, employed by the Government, devoting his energies to measures for the improvement of sanitation.

Activities during the year were confined to the Castries Valley area, immediately surrounding Castries, the seaport and seat of Government of the Island. Work had been completed in one third of this area during the last six months of 1915; it was completed in the remaining two thirds during 1916. The area as a

whole embraced a population of 10,482 persons, of whom 5,936, or 56.6 per cent, were residents of the town of Castries. The remainder of the inhabitants lived in districts suburban rather than rural. More than 98 per cent were colored.

Examination and Treatment

Excluding the preliminary infection survey conducted during the closing months of 1914, the staff had enumerated in the work extending from January 1, 1915, to December 31, 1916, a census of 14,363 persons. Of this total population, 13,927, or 97.0 per cent, were examined for hookworm disease, and 6,772, or 48.6 per cent, were found to be infected. First treatment was administered to 6,307 persons,—93.1 per cent of those found infected; and 4,081—64.7 per cent of those who received first treatment—were cured. Table 1 presents a summary of the results of examination and treatment up to December 31, 1916, showing separately the results accomplished in the areas completed during 1915 and during 1916. In the areas completed during 1916, there was a decrease in the volume of results, but in every detail the work during this period was more careful and more thorough, and its results may be expected to be more permanent. (See Table 1, page 138.)

The portion of the Castries Valley in which work was conducted during 1916 was divided for convenience into two sections, separated by

TABLE 1: *St. Lucia—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from January 1, 1915, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	14,363	....	6,214	....	8,149	....
2. Examined.....	13,927	97.0	6,003	96.6	7,924	97.2
3. Found Infected	6,772	48.6	2,336	38.9	4,436	56.0
4. Given First Treatment.....	6,307	93.1	2,201	94.2	4,106	92.6
5. Cured.....	4,081	64.7	1,904	86.5	2,177	53.0

natural boundaries. The staff devoted a period of six months to the work in each section. In Table 2 the results accomplished during each half-yearly period are compared. (See Table 2, page 139.)

The section in which work was conducted during the first half year included a larger proportion of town residents than the second; consequently, the percentage of persons found infected was lower, being 32.4 in the first half as compared with 47.0 in the second. The suburban districts have been found to show a steady increase in infection as the work has proceeded farther from the town.

Table 3 presents figures showing the number of persons remaining uncured in the work con-

TABLE 2: *St. Lucia—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916*

With Comparison of Figures for Areas Completed During the First and Second Half Years, Respectively

	TOTAL FOR 1916		FIRST HALF 1916		SECOND HALF 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.	6,214	....	3,455	....	2,759	....
2. Examined.	6,003	96.6	3,331	96.4	2,672	96.8
3. Found Infected	2,336	38.9	1,079	32.4	1,257	47.0
4. Given First Treatment.	2,201	94.2	1,012	93.8	1,189	94.6
5. Cured.	1,904	86.5	901	89.0	1,003	84.4

ducted during 1916. Of the 2,336 persons found infected during this year, only 311, or 13.3 per cent, remained in the area uncured at the close of work. More than half of these were persons under treatment. The failure to treat all of the infected persons until they had been cured was due almost wholly to the migratory habits, procrastination, and shiftlessness of certain members of the negro laboring population. (See Table 3, page 140.)

Table 4 gives the details of the work of examination and treatment during 1916, and includes the supporting figures upon which Tables 2 and 3 are based. (See Table 4, page 141.)

The figures in these four tables do not include the results accomplished by the out-

TABLE 3: *St. Lucia—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916*

With Comparison of Figures for Areas Completed During the First and Second Half Years, Respectively

	TOTAL FOR 1916		FIRST HALF 1916		SECOND HALF 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	2,336	..	1,079	..	1,257	..
2. Cured.....	1,904	81.5	901	83.5	1,003	79.8
3. Removed.....	121	5.2	52	4.8	69	5.5
4. Remaining in Area Uncured.....	311	13.3	126	11.7	185	14.7
1) Refused.....	80	3.4	57	5.3	23	1.8
2) Medical Reasons	15	.6	9	.8	6	.5
3) Under Treatment	216	9.2	60	5.6	156	12.4

patient department at the central office, where persons are examined and treated who live outside the areas in which operations are being conducted. The following summary shows the number of persons examined, found infected, and cured by this department up to December 31, 1916:

	TOTAL	DURING 1916	DURING 1915
1. Examined.....	305	251	54
2. Found Infected.....	138	120	18
3. Cured.....	61	54	7

There were also 139 persons cured during 1916 in addition to those reported in this summary. These were persons who had been classified as "Under Treatment" in earlier reports. The total number cured up to December 31, 1916,

TABLE 4: *St. Lucia—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916*

With Comparison of Figures for Areas Completed During the First and Second Half Years, Respectively

	Total for 1916	First Half 1916	Second Half 1916
1. Census	6,214	3,455	2,759
2. Examined	6,003	3,331	2,672
3. Not Examined.....	211	124	87
1) Removed.....	65	21	44
2) Refused.....	141	100	41
3) Died.....	5	3	2
4. Found Infected.. ..	2,336	1,079	1,257
5. Given First Treatment...	2,201	1,012	1,189
6. Not Given First Treatment ..	135	67	68
1) Removed.....	61	21	40
2) Refused.....	58	37	21
3) Medical Reasons.....	13	8	5
4) Died.....	3	1	2
7. Cured	1,904	901	1,003
8. Given First Treatment but Not Cured.....	297	111	186
1) Removed.....	54	29	25
2) Refused.....	22	20	2
3) Medical Reasons.....	2	1	1
4) Died.....	3	1	2
5) Under Treatment.....	216	60	156

was therefore 4,281, instead of 4,081, as indicated in Table 1.

Educational Work

The nurses in visiting the patients, and the Medical Officer in conversing with persons at the central office, have used every opportunity

to acquaint the people with the measures necessary for curing and preventing hookworm disease. Lectures to the public, particularly to school-children, have been held at frequent intervals during the year, and an address has been delivered to the students of Saint Mary's College, the only school of higher education in the colony.

The managers of primary schools have evinced a determined effort to assist the work, and among the teachers the coöperation, on the whole, has been all that could be desired. In a few cases, however, it has seemed that the teachers have failed to appreciate the benefits which would result if both themselves and their pupils were freed of the infection. The Administrator has therefore instructed the Inspector of Schools to impress upon them the fact that they and their scholars should be treated and freed of the disease, and that latrines should be used to prevent re-infection.

Sanitary Improvement

Sanitary regulations framed by the Board of Health require that all premises (including schools and business places) shall be provided with satisfactory accommodations for disposing of human feces. Medical officers, the Inspector of Nuisances, and the special sanitary inspector appointed by the Government are clothed with power to see that the regulations are enforced.

At a meeting on March 16, 1916, a joint committee of representatives of the General Board of Health and of the Castries Town Board unanimously agreed as to the most satisfactory and economical method of disposing of sewage in Castries and its vicinity. This body recommended that the inhabitants of the town of Castries be permitted to continue dumping their refuse into the sewage barge which anchors nightly in the river; that an additional barge be provided for the section of the town most remote from the anchorage of the present barge; and that, for the low-lying localities just outside the town boundaries, central dumping depots of the pit type, with proper precautions against the contamination of underground waters by seepage, be established. The territory served by each of these depots will not extend beyond a radius of one half mile. The first of the depots was opened in October, and arrangements are being made to open others in the localities suggested by the committee. Provision for the additional barge was also included in the financial estimates for 1917-1918.

In the portions of the area which will not be served either by the sewage barges or by the dumping depots, effort will be made to have latrines installed. In these outlying districts there are 411 houses. On December 31, 1916, the conditions of disposal at 226, or 55.0 per cent, were satisfactory. The erection of an out-

building for permanent or temporary disposal of sewage will be required at every house located outside the town, while in the town effort will be made to discourage the practice of keeping in living rooms, or in other places accessible to flies and poultry, the utensils in which the feces are carried to the depot or barge for disposal. Properly constructed fly-proof boxes, for use in storing the feces in the outbuilding, are furnished free of charge on orders issued by the field inspector.

Sanitary supervision will be exercised over the areas in which the work of examination and treatment has ended, but unless the Government sanitary staff is considerably enlarged there may be some degree of reversion to insanitary practices, especially in the rural districts. To prevent this, and to see that effective supervision is maintained, the number of sanitary inspectors will be increased as soon as possible.

ST. VINCENT

Active measures for the relief and control of hookworm disease have been conducted in St. Vincent during the past year by two separate staffs, coördinated under the general supervision of Dr. C. H. Durrant, the Colonial Surgeon. One staff devotes its energies to the work of examination and treatment; the other endeavors to secure sanitary improvement. The staff employed in curative measures includes, besides the Medical Officer in Charge, two microscopists and six nurses. On November 13, 1915, Dr. P. B. Gardner succeeded Dr. W. P. Jacocks as Medical Officer in Charge of the curative work.

The only inhabited part of St. Vincent is the narrow strip of land lying between the central mountain range, which extends the entire length of the island, and the seacoast on both sides. It is planned to complete work on the windward, or eastern, side before beginning on the leeward. Despite the rugged character of the country, the scarcity of good roads, the widely scattered population, and the long rainy season, it has been found feasible to conduct operations by the intensive plan. Small areas are selected, and the work is confined to them until as many as possible of the infected inhabitants have been treated and cured.

The area in which the work of examination and treatment had been completed up to De-

cember 31, 1916, embraced the territory on the windward side, extending for a distance of eleven miles from Kingstown, the seat of government. Within this small territory is included the most populous part of the island. It was subdivided, for convenience in conducting operations, into five smaller areas: Calliaqua, Belair, Sion Hill, Stubbs, and Mesopotamia. Activities in the two first-named areas were completed during 1915 and were described in the second annual report. During 1916 work was completed in the Sion Hill, Stubbs, and Mesopotamia areas.

The Sion Hill area, the first to be completed during 1916, included all the territory between the town of Kingstown and the Calliaqua and Belair areas. Headquarters were established on Sion Hill, near Kingstown. One estate and two villages just outside of Kingstown were included in the area, but no portion of the town itself. In the census taken by the field staff, 1,880 persons, living in 366 homes, were enumerated. About one half were white; the others, black or colored.

The Stubbs area had as its center the large village of that name, located on the seacoast about eight miles from Kingstown. The area, triangular in shape, had a base five miles long on the seacoast and extended inland for a distance of two and one-half miles. There were four villages and four estates within its limits.

Headquarters were at Stubbs. The population numbered 2,362; the homes, 457. Of the population, about 95 per cent were black or colored, 3 per cent white, and 2 per cent Indians.

The Mesopotamia area was entirely inland. It was composed of a large, crater-like valley, circular in shape, surrounded on all sides by mountains. The field office was located in its center, a distance of nine miles from Kingstown. The majority of the inhabitants lived in six small villages, but there were many scattered homes on the sides of the surrounding mountains. In one instance, two families lived three miles from the nearest neighbor and five miles from the field office. The entire population of this area was agricultural. There were three small estates, but, as in the Sion Hill and Stubbs areas, the majority of the inhabitants owned and tilled their own small plots of land. The census enumerated 696 homes and 3,325 persons. Approximately 97 per cent of the inhabitants were black or colored, 1 per cent East Indian, and 2 per cent white.

Examination and Treatment

In the five areas in which the work had been completed up to December 31, 1916, there was a total population of 11,392. Only 76 of these persons, representing slightly more than one half of 1 per cent of the total population, were not examined for hookworm disease,—the majority

because of refusal. Of the 11,316 persons examined, 5,738, or 50.7 per cent, were found to be infected; and 5,338, or 93.0 per cent of those infected, received first treatment. Microscopic re-examination showed that 4,664, or 87.4 per cent of those receiving first treatment, had been cured. Table 1, in which these figures are exhibited, presents separately the results accomplished in the areas completed during 1915 and 1916.

TABLE 1: *St. Vincent—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from May 1, 1915, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP To DECEMBER 31, 1916		DURING 1916		DURING 1915	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
1. Census.....	11,392	....	7,567	....	3,825	....
2. Examined.....	11,316	99.3	7,494	99.0	3,822	99.9
3. Found Infected.....	5,738	50.7	4,062	54.2	1,676	43.9
4. Given First Treatment.....	5,338	93.0	3,748	92.3	1,590	94.9
5. Cured.....	4,664	87.4	3,314	88.4	1,350	84.9

The average percentage of persons found infected and the average percentage of persons cured was higher in the three areas completed during 1916 than in the two areas completed during 1915. Separate figures for each of the 1916 areas are given in Table 2.

TABLE 2: *St. Vincent—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916, by Areas*

	TOTAL		SION HILL		STUBBS		MESOPOTAMIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	7,567	....	1,890	....	2,362	....	3,325	....
2. Examined.....	7,494	99.0	1,853	98.6	2,346	99.3	3,295	99.1
3. Found Infected.....	4,062	54.2	1,120	60.4	1,063	45.3	1,879	57.0
4. Given First Treatment.....	3,748	92.3	1,030	92.0	978	92.0	1,740	92.6
5. Cured.....	3,314	88.4	907	88.1	887	90.7	1,520	87.4

The Sion Hill area presented the highest percentage of infection during the year, but the infection throughout this area was not uniform. In Sion Hill village, located near Kingstown, where many of the inhabitants use the public latrine over the sea, only about 30 of every 100 persons were infected, as compared with 85 in portions of the district further inland, where there are practically no sanitary conveniences.

In Table 3, which shows the number of persons remaining uncured in the three areas completed during 1916, the effectiveness of the work on the curative side is best exhibited. It will be seen that in the three areas combined, there remained uncured at the close of work only 17.0 per cent of the persons originally found infected. Approximately one fourth of these refused to accept treatment, another one fourth could not be treated for medical reasons, and one half received one or more treatments but had not been cured when the work was brought to a close. (See Table 3, page 151.)

Table 4 presents figures showing in detail and by areas the results accomplished in the work of examination and treatment during 1916. In the Sion Hill area, the majority of the persons who refused to coöperate were residents of Sion Hill village; in the Mesopotamia area those who refused to coöperate lived in two small villages. Elsewhere in these areas the residents coöperated willingly. (See Table 4, page 152.)

TABLE 3: *St. Vincent—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916, by Areas*

	TOTAL		SION HILL		STUBBS		MESOPOTAMIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	4,062	....	1,120	....	1,063	....	1,879	....
2. Cured.....	3,314	81.6	907	81.0	887	83.4	1,520	80.9
3. Removed.....	59	1.5	21	1.9	11	1.0	27	1.4
4. Remaining in Area Uncured....	689	17.0	192	17.1	165	15.5	332	17.7
1) Refused.....	150	3.7	33	2.9	48	4.5	69	3.7
2) Medical Reasons.....	161	4.0	49	4.4	47	4.4	65	3.5
3) Under Treatment.....	378	9.3	110	9.8	70	6.6	198	10.5

TABLE 4: *St. Vincent—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916, by Areas*

	Total	Sion Hill	Stubbs	Mesopotamia
1. Census.....	7,567	1,880	2,362	3,325
2. Examined.....	7,494	1,853	2,346	3,295
3. Not Examined.....	73	27	16	30
1) Removed.....	12	3	4	5
2) Refused.....	53	22	10	21
3) Insane.....	2	2	..	..
4) Died.....	6	..	2	4
4. Found Infected.....	4,062	1,120	1,063	1,879
5. Given First Treatment	3,748	1,030	978	1,740
6. Not Given First Treatment	314	90	85	139
1) Removed.....	46	14	9	23
2) Refused.....	107	27	29	51
3) Medical Reasons	161	49	47	65
7. Cured.....	3,314	907	887	1,520
8. Given First Treatment but Not Cured.....	434	123	91	220
1) Removed.....	13	7	2	4
2) Refused.....	43	6	19	18
3) Under Treatment....	378	110	70	198

Educational Work

The purpose and scope of the work are explained to the people in handbills and posters distributed throughout each area before the work of examination and treatment begins. Preliminary public lectures also are given in areas having buildings suitable for public assembly. These lectures are illustrated by lantern slides describing the disease. In all of the schools

located in the areas wherein work has been conducted, lectures accompanied by microscopic demonstrations of the ova and embryos have been a feature. Persons who visit the staff headquarters in each area are shown charts and given general information concerning the disease, and opportunity is afforded them to look at the eggs and larvae with the microscope.

Table 5 indicates that in the work up to December 31, 1916, a total of 19 lectures had been delivered to an attendance estimated at 4,162 persons. Eight of the lectures were to the public and eleven to school children.

TABLE 5: *St. Vincent—Intensive Work: Number of Lectures Delivered in Areas Completed from May 1, 1915, to December 31, 1916, with Attendance*

With Comparison of Figures for Areas Completed During
1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
1. Total Lectures.....	19	8	11
1) Public.....	8	4	4
2) School.....	11	4	7
2. Attendance at Lectures	4,162	2,100	2,062
1) Public.....	2,750	1,550	1,200
2) School.....	1,412	550	862

The number of lectures delivered in each of the three areas completed during 1916 is shown in detail in Table 6.

TABLE 6: *St. Vincent—Intensive Work: Number of Lectures Delivered in Areas Completed During 1916, with Attendance, by Areas*

	Total	Sion Hill	Stubbs	Mesopotamia
1. Total Lectures.....	8	1	3	4
1) Public.....	4	..	2	2
2) School.....	4	1	1	2
2. Attendance at Lectures	2,100	75	1,050	975
1) Public.....	1,550	..	850	700
2) School.....	550	75	200	275

During the year the nurses found that demonstrations with the microscope in the homes of persons who had been unwilling to coöperate in the work were effective in overcoming indifference or opposition. Visits of this kind to the homes of these obdurate persons have therefore become an important factor in the educational work.

Sanitary Improvement

The work of the staff employed by the Government in the construction of latrines is still far behind that of the staff engaged in examination and treatment. The aim is to have the sanitary and curative work proceed simultaneously in each area, but the greater part of the sanitary work is not done until after the work of examination and treatment has ended and until the majority of the persons who have been cured have had opportunity to be re-infected. No

compulsion is used in securing sanitary improvement. The Government makes and sells for eighteen cents a fly-proof box to be placed over a pit, and the sanitary staff installs the box for every person who will purchase one and dig a pit.

Table 7 presents a comparison of the number and percentage of homes with latrines when the work of examination and treatment was begun, with the number and percentage when the work ended. In the five areas in which the curative work had been completed up to December 31, 1916, there were 2,255 homes. On the first inspection, made when the work began, latrines were found at 395 homes, or 17.5 per cent of the total, as compared with 905, or 40.1 per cent,

TABLE 7: *St. Vincent—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed from May 1, 1915, to December 31, 1916*

With Comparison of Figures for Areas Completed During
1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected . . .	2,255	....	1,519	....	736	....
2. Homes with Latrines:						
1) First Inspection	395	17.5	309	20.3	86	11.7
2) Last Inspection	905	40.1	456	30.0	449	61.0
3. Homes Provided with New Latrines . . .	510	22.6	147	9.7	363	49.3

TABLE 8: *St. Vincent—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed During 1916, by Areas*

	TOTAL		SION HILL		STUBBS ¹		MESOPOTAMIA	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	1,519	....	366	....	457	....	696	....
2. Homes With Latrines:								
1) First Inspection.....	309	20.3	78	21.3	90	19.7	141	20.3
2) Last Inspection.....	456	30.0	108	29.5	191	41.8	157	22.6
3. Homes Provided With New Latrines.....	147	9.7	30	8.2	101	22.1	16	2.3

¹Conditions October 31, two months after work of examination and treatment ended.

TABLE 9: *St. Vincent—Intensive Work: Additional Sanitary Improvement Subsequent to the Close of Curative Work, During 1916, by Areas*

AREA	New Latrines Erected	Old Latrines Improved	Homes Remaining Without Latrines	
			No.	Per cent of Homes in Area
Total	246	35	992	57.1
Belair.....	159	..	16	7.3
Sion Hill.....	40	18	218	59.6
Stubbs.....	47	14	219	47.9
Mesopotamia....	..	3	539	77.4

on the last inspection, made at the close of the work. The number of homes at which latrines were erected during the progress of the work was therefore 510, representing 22.6 per cent of the total. (See Table 7, page 155.)

The figures presented in Table 8 compare the conditions on first and last inspections in the three areas completed during 1916. (See Table 8, page 156.)

This table indicates that during 1916, only 147 new latrines were erected at homes located within the areas of operation while the work of examination and treatment was in progress. However, this does not measure the full extent of sanitary reform accomplished. After the curative work had ended, efforts at sanitary improvement continued in each of the areas, and 246 additional new latrines were erected

and 35 old latrines improved. These figures are exhibited in Table 9. (See Table 9, page 157.)

As this table indicates, on December 31, 1916, there remained, among the total homes in the Belair, Sion Hill, Stubbs, and Mesopotamia areas, 992 homes, or 57.1 per cent, to be provided with latrines. The sanitary work will undoubtedly proceed until latrines have been erected at practically all of these homes.

TRINIDAD

Measures against hookworm disease in Trinidad are conducted as a department of the Government Medical Service, under the supervision of the Surgeon General. During 1916, the work has been conducted entirely by the intensive plan. From January 1, 1916, to May 19, 1916, Dr. B. E. Washburn continued active direction of the curative work, under the designation of Medical Officer in Charge. From May 19 to the close of the year, Dr. Washburn was on leave of absence, and the work was in the hands of Dr. George C. Payne, who served as Acting Medical Officer in Charge. The staff consists of six clerks, four microscopists, ten nurses, and one caretaker.

Operations were conducted during the year in four adjoining areas: Tunapuna, Tacarigua, Arouca, and Lopinot, all included within the ward union, or borough, of Tacarigua. With the exception of Lopinot, these areas extend eastward for a distance of about six miles along the Government railway, running from Port-of-Spain, the capital, to Sangre Grande. The Lopinot area is located in a range of hills in the northern part of the ward union; on its southern boundary it is contiguous with the Arouca area.

All four areas include, besides one large village from which the area takes its name, a number of smaller villages. Neither the separate villages

nor the areas as a whole, however, form any sort of entity; they are merely a series of villages formerly occupied by free laborers on adjoining sugar estates, which have gradually grown together to form a compact, thickly settled strip along the railway. During the progress of the work in each area, headquarters for the staff were established in the village from which the area took its name. Almost all the inhabitants of the four areas engage in raising cocoa or sugar,—some as laborers on the large estates, the majority on small holdings which they own or lease. About 40 per cent are East Indians, the remainder consisting largely of persons of mixed negro or European blood.

Work was in progress during 1916 in two other areas located further east along the Government railway, but the operations in these areas had not been completed by December 31, 1916. It was also found possible, during the progress of the work in the other areas, to conduct a second campaign in the Tacarigua Orphanage,—a small institution included within the boundaries of the original Tacarigua area, in which about 225 boys and girls under 17 years of age are housed. Special effort has been made to eradicate the disease from this institution.

Examination and Treatment

From August 11, 1914, the date on which measures against hookworm disease in Trinidad

were inaugurated, until May 15, 1915, the work was conducted according to the dispensary method. Since the latter date, however, a strictly intensive plan of work has been followed.

Table 1 indicates that the total number of persons examined in all of the work conducted up to December 31, 1916, was 23,651,—13,447 in the areas completed by the intensive method during 1916, and 10,204 in those completed by the dispensary method prior to 1916. Of the total number examined in all of the work to date, 16,148, or 68.3 per cent, were found infected; 13,524, or 83.8 per cent of those infected, were given first treatment; and 7,636—56.5 per cent of those receiving first treatment—were cured. In the table a comparison is given of the results accomplished by the dispensary and intensive methods. (See Table 1, page 162.)

Although intensive work was in progress during seven and one half months in 1915, all results accomplished by this method are assigned to the year 1916, owing to the fact that no area had been completed by this plan of work up to the end of 1915. For the Tunapuna area, in which operations were not brought to a close until April 30, 1916, the figures published in the second annual report have been withdrawn from the year 1915 and re-assigned to 1916.

In the four areas in which operations by the intensive plan had been completed up to December 31, 1916, there was a population of 14,156

TABLE 1: *Trinidad—Dispensary and Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from August 11, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
			Intensive Method		Dispensary Method	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	.....	....	14,156	....	.....	....
2. Examined.....	23,651	....	13,447	95.0	10,204	....
3. Found Infected.....	16,148	68.3	10,021	74.5	6,127	60.0
4. Given First Treatment.....	13,524	83.8	8,997	89.8	4,527	73.9
5. Cured.....	7,636	56.5	7,110	79.0	526	11.6

persons, 13,447 of whom, or 95.0 per cent, were examined for hookworm disease. Of those examined, 10,021, or 74.5 per cent, were found infected; and first treatment was administered to 8,997, or 89.8 per cent, of those infected. Re-examination showed that 7,110 persons, representing 79.0 per cent of those receiving first treatment, had been cured. Figures in detail, by areas, are shown in Table 2. (See Table 2, page 163.)

On an average, approximately three of every four persons examined in all four of the areas were found infected. The fact that many of the villages are built on the sites of former sugar

TABLE 2: *Trinidad—Intensive Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916, by Areas*

	TOTAL		TUNAPUNA		TACARIGUA		AROUCA		LOPINOT		TACARIGUA ORPHANAGE ¹	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census	14,156	....	7,428	....	2,623	....	3,260	....	621	....	224	....
2. Examined	13,447	95.0	6,835	92.0	2,581	98.4	3,201	98.2	606	97.6	224	100.0
3. Found Infected	10,021	74.5	4,838	70.8	2,155	83.5	2,458	76.8	512	84.5	58	25.9
4. Given First Treatment	8,997	89.8	4,319	89.3	1,898	88.1	2,253	91.7	471	92.0	56	96.6
5. Cured	7,110	79.0	3,185	73.9	1,597	84.1	1,910	84.8	362	76.9	56	100.0

¹ Second campaign.

estates, which have been heavily infected for many years, is undoubtedly largely responsible for the high rate of infection found. Furthermore, many of the East Indians included in the population of these areas are employed on the nearby sugar estates, where they come in contact with the heavily infected indentured laborers and receive many opportunities to become infected.

The effectiveness of the work in reducing the amount of existing infection is exhibited in Table 3. In the four areas a total of 10,021 persons were originally found infected. Of these, 2,062, or 20.6 per cent, remained in the areas uncured at the close of work. Approximately three fifths of the persons not cured refused to accept or to continue treatment, while about one third could not be treated for medical reasons. (See Table 3, page 165.)

Figures in detail showing the results of examination and treatment in the areas completed during 1916 are exhibited in Table 4. In this table are presented the supporting figures upon which Tables 2 and 3 are based. (See Table 4, page 166.)

Educational Work

The first step in conducting educational work in an area is to hold a public meeting for acquainting the people with the nature and scope of the measures to be undertaken against hookworm disease. This meeting is usually attended

TABLE 3: *Trinidad—Intensive Work: Number of Persons Remaining Uncured in Areas Completed During 1916, by Areas*

	TOTAL		TUNAPUNA		TACARIGUA		AROUCA		LOPINOT		TACARIGUA ORPHANAGE	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	10,021	....	4,838	....	2,155	....	2,458	....	512	....	58	....
2. Cured.....	7,110	71.0	3,185	66.0	1,597	74.1	1,910	77.7	362	70.7	56	96.6
3. Removed.....	849	8.5	626	12.9	69	3.2	136	5.5	16	3.1	2	3.4
4. Remaining in Area Uncured.....	2,062	20.6	1,027	21.1	489	22.7	412	16.8	134	26.2	..	....
1) Not Located....	31	.3	....	....	26	1.2	3	.1	2	.4	..	....
2) Refused.....	1,227	12.2	728	15.0	271	12.6	208	8.5	20	3.9	..	....
3) Medical Reasons	699	7.0	299	6.2	192	8.9	172	7.0	36	7.0	..	....
4) Under Treat- ment.....	105	1.0	....	....	....	....	29	1.2	76	14.8	..	....

TABLE 4: *Trinidad—Intensive Work: Detailed Results of Examination and Treatment in Areas Completed During 1916, by Areas*

	Total	Tunapuna	Tacarigua	Arouca	Lopinot	Tacarigua Orphanage
1. Census.....	14,156	7,428	2,623	3,260	621	224
2. Examined.....	13,447	6,835	2,581	3,201	606	224
3. Not Examined.....	709	593	42	59	15	..
1) Not Located.....	19	7	9	3	..	..
2) Refused.....	233	158	24	40	11	..
3) Removed.....	446	417	9	16	4	..
4) Died.....	11	11	..	..	..	..
4. Found Infected.....	10,021	4,838	2,155	2,458	512	58
5. Given First Treatment.....	8,997	4,319	1,898	2,253	471	56
6. Not Given First Treatment.....	1,024	519	257	205	41	2
1) Not Located.....	31	..	26	3	2	..
2) Refused.....	192	109	36	37	10	..
3) Medical Reasons.....	569	235	167	141	26	..
4) Removed.....	222	171	26	22	2	1
5) Died.....	10	4	2	2	1	1
7. Cured.....	7,110	3,185	1,597	1,910	362	56
8. Given First Treatment but Not Cured.....	1,887	1,134	301	343	109	..
1) Refused.....	1,035	619	235	171	10	..
2) Medical Reasons.....	130	64	25	31	10	..
3) Removed.....	607	446	88	111	12	..
4) Died.....	10	5	3	1	1	..
5) Under Treatment.....	105	..	..	29	76	..

by dignitaries of church and state, by medical officers and school teachers, by prominent planters, and by other influential persons. Following this meeting, lectures illustrated by charts and magic lantern pictures, and accompanied by microscopic demonstrations, are held in the different schools. An effort is made to have present at some one of these lectures at least one representative of every family in the area. In addition, there are many informal talks in the homes of the people and in the office,—those in the office being illustrated with charts and photographs and accompanied by demonstrations of ova and embryos.

In Table 5 figures are given showing the number of lectures delivered up to December 31, 1916, with the estimated total attendance. (See Table 5, page 168.)

In Table 6 figures representing the extent of educational work during 1916 are shown by areas. (See Table 6, page 169.)

In the Arouca area the practice of giving open-air lectures was inaugurated. Rough drawings on frosted glass, accompanied by local photographs, are used in a revolving lantern purchased especially for these meetings. The screen is hung on the side of a building or suspended from the limb of a tree. By this means it has been found possible to reach and influence large numbers of persons whose coöperation in the work would otherwise have been difficult to obtain.

TABLE 5: *Trinidad—Dispensary and Intensive Work: Number of Lectures Delivered from August 11, 1914, to December 31, 1916, with Attendance*

With Comparison of Figures for 1916 and Prior to 1916

	Up to December 31, 1916	During 1916	Prior to 1916
1. Total Lectures.....	45	25	20
1) Public.....	31	16	15
2) School.....	14	9	5
2. Attendance at Lec- tures.....	9,745	5,395	4,350
1) Public.....	7,846	4,146	3,700
2) School.....	1,899	1,249	650
3. Special Conferences ...	34	25	9
4. Attendance at Special Conferences	620	434	186

In addition to the educational work by lectures, many leaflets and pamphlets are circulated and letters written. Table 7 presents a summary showing, by areas, the pieces of literature distributed in the areas completed during 1916.

TABLE 7: *Trinidad—Intensive Work: Number of Pieces of Literature Distributed in Areas Completed During 1916, by Areas*

	Total	Tunapuna	Tacarigua	Arouca	Lopinot
Total....	5,971	2,629	1,349	1,793	200
Letters.....	1,041	189	279	573	..
Pamphlets.....	80	40	20	20	..
Leaflets.....	4,850	2,400	1,050	1,200	200

TABLE 6: *Trinidad—Intensive Work: Number of Lectures Delivered in Areas Completed During 1916, with Attendance, by Areas*

	Total	Tunapuna	Tacarigua	Arouca	Lopinot	Tacarigua Orphanage
1. Total Lectures.....	25	5	5	8	6	1
1) Public.....	16	5	1	5	5	..
2) School.....	9	..	4	3	1	1
2. Attendance at Lectures.....	5,395	2,400	708	1,678	388	221
1) Public.....	4,146	2,400	300	1,098	348	..
2) School.....	1,249	..	408	580	40	221
3. Special Conferences.....	25	7	14	4	..	..
4. Attendance at Special Conferences...	434	132	238	64	..	..

Sanitary Improvement

In the principal village of each of the areas completed during 1916, sanitary conditions were better than in the average tropical town. In Tunapuna, an ample supply of water from mountain streams is piped along the streets and into some of the houses. The streets are well graded and the village is well drained. When measures against hookworm disease in this village were begun, all but 31 of the homes were found to be provided with satisfactory latrines, and at these 31 homes new latrines have since been built by order of the Government authorities.

In the village of Tacarigua, the water supply comes from the same source as that of Tunapuna; there are excellent roads; and the land is well drained by roadside gutters. In Arouca also the drainage is good, but the people depend for their drinking water upon wells, streams, and rainfall collected from roofs.

Table 8 affords a comparison, for the areas in which operations were completed during 1916, of the number of homes provided with latrines when the work of examination and treatment began, with the number so provided when it ended. It will be seen that of 3,395 homes located within the boundaries of these areas, 2,409, or 71.0 per cent, were found to be provided with latrines on the first inspection. Practically all of these homes with latrines were

included within the boundaries of the principal towns. (See Table 8, page 172.)

Very little progress was made in having new latrines installed at homes where none existed. The table shows that only 2,638 homes, or 77.7 per cent of the total, were provided with latrines when the work of examination and treatment ended. This indicates that during the progress of the work, only 229 additional homes were provided with latrines. In the Arouca area, the latrines at 104 homes fell down or were abandoned between the first and last inspections, so that although 50 homes in this area were provided with new latrines during the progress of the work, the records indicate that the number of homes with latrines was 54 less when the work ended than when it began. If the figures for this area are excluded, the number of additional homes provided with latrine accommodation during the progress of the work was 283, instead of 229.

Until December 31, 1916, the enforcement of laws governing the installation and use of latrines was in the hands of the Surgeon General, who depended upon the wardens for assistance in carrying out his orders. Beginning with the new year, however, the Government has placed entire responsibility for sanitary improvement in the hands of the local authorities, and has given assurance that this work will be pushed with great vigor.

TABLE 8: *Trinidad—Intensive Work: Homes Provided with Latrine Accommodation During Progress of Work in Areas Completed During 1916, by Areas*

	TOTAL		TUNAPUNA		TACARIGUA		AROUCA		LOPINOT	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected.....	3,395	....	1,827	....	630	....	809	....	129	....
2. Homes with Latrines:										
1) First Inspection.....	2,409	71.0	1,495	81.8	290	46.0	565	69.8	59	45.7
2) Last Inspection.....	2,638	77.7	1,675	91.7	392	62.2	511	63.2	60	46.5
3. Homes Provided with New Latrines	229	6.7	180	9.9	102	16.2	—54	—6.7	1	.8

COSTA RICA

Operations for the relief and control of hookworm disease in Costa Rica are conducted by a division of the national Department of Police known as the Department of Ankylostomiasis. Headquarters are in the city of San Jose. Dr. Louis Schapiro, the Director in charge, is assisted in the medical work by a staff consisting of an assistant director, three field directors, four microscopists, and a secretary. Throughout the year 1916, three permanent inspectors have been employed to give attention to sanitary improvement. In August, 1916, four additional temporary inspectors, to be employed locally in the various areas of operation, and three additional local clerks, were authorized. Under the regulations establishing the Department, the provincial governors, the police, and the official physicians are required to aid the work, particularly with regard to sanitation.

The work since its establishment on September 23, 1914, has followed the dispensary plan, though in the later operations there has been an approach to the intensive system in every area where the topography and proximity of the homes would permit. In the latter plan of work, a definite area is selected and an accurate house and resident census taken. At this time containers and identification cards are left, and each person is informed as to the date on which he

should appear at the dispensary for examination and treatment. Frequent visits are made to all the homes, to urge those who have not presented specimens to come to the dispensary, and those who have taken treatment to return for re-examination. After the lapse of a reasonable time, the inspectors or local sanitary police call for specimens and deliver treatments to persons who have not absolutely refused to coöperate.

The Republic is divided into seven provinces and 46 cantons, the canton corresponding to a county in the United States. The canton is usually the unit of operations, though in some cases certain districts within the cantons are selected and worked as units in themselves. Exclusive of the laboratory and dispensary maintained in the city of San Jose, where work has been in progress since March 1, 1915, operations were conducted during 1916 in 12 areas located in four provinces of the Republic. In three of these areas, the work remained in progress on December 31, 1916; for this reason the figures for these areas are excluded from this report. The areas in which the work was completed are listed in Table 3, page 178. To certain of these areas—among them Canas, Santa Cruz, and Liberia—it is proposed later to return, the unusually heavy rains during the summer having interfered with the work to such an extent that the operations in them could not be brought to a successful conclusion.

Examination and Treatment

The total population of the areas completed from the inauguration of the work in Costa Rica on September 23, 1914, up to December 31, 1916, was 90,707. The number of persons examined was 70,876, or 78.1 per cent of the population; and 42,009, or 59.3 per cent of those examined, were found infected. First treatment was administered to 40,853 persons,—97.2 per cent of those infected; and 7,628—18.7 per cent of those receiving first treatment—were cured. These figures are shown in Table 1, which also presents separately the results accomplished in the areas completed during 1915 and 1916.¹

TABLE 1: *Costa Rica—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from September 23, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	90,707	....	46,114	....	44,593	....
2. Examined.....	70,876	78.1	40,579	88.0	30,297	67.9
3. Found Infected	42,009	59.3	22,608	55.7	19,401	64.0
4. Given First Treatment.....	40,853	97.2	22,037	97.5	18,816	97.0
5. Cured.....	7,628	18.7	5,666	25.7	1,962	10.4

¹ No areas were completed during 1914.

Included in the above statistics are the results accomplished at the Central Office during the period from March 1, 1915, to December 31, 1916. Here the dispensary is in constant operation, the work is conducted on a basis different from that in the field, and the figures are not strictly comparable with those for the field dispensaries. Table 2, therefore, presents separately the results in the field and at the Central Office during the entire period of work. In all tables in this chapter the figures for the central office at San Jose have been assigned entirely to the year 1916, owing to the difficulty, under the present system of reporting, of separating these figures by years.

TABLE 2: *Costa Rica—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed from September 23, 1914, to December 31, 1916*

With Comparison of Figures for Field Dispensaries and Central Office

	TOTAL		FIELD DISPENSARIES		CENTRAL OFFICE	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	90,707	....	74,412	....	16,295	....
2. Examined.....	70,876	78.1	54,581	73.3	16,295	....
3. Found Infected	42,009	59.3	37,119	68.0	4,890	30.0
4. Given First Treatment.....	40,853	97.2	36,210	97.6	4,643	94.9
5. Cured.....	7,628	18.7	6,213	17.2	1,415	30.5

Table 3 presents information showing in detail, by provinces and cantons, the number of

persons enumerated in the census, examined, found infected, given first treatment, and cured in the areas completed during 1916. In this table are included the figures for the Central Office as well as the field dispensaries. (See Table 3, page 178.)

It should be pointed out that the figures now reported for 1915 are not consistent with those published in the annual report for that year. During 1916, the records in Costa Rica were thoroughly revised, the results accomplished in each area were re-assigned to the year during which the work in the area was completed, and figures for all work remaining uncompleted at the end of 1916 were excluded. New figures have also been furnished to show the number of persons examined and found infected; in earlier reports, the figures for examinations had related to the number of specimens.

Educational Work

In each district within the areas of operation at least two lectures are given, one to the public and the other to school children. These lectures are followed by house talks and conferences at the dispensary. The house talks have been found to afford the best medium for keeping in touch with the people and maintaining their interest in the work. On every visit to a district the director and assistant direc-

TABLE 3: *Costa Rica—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured in Areas Completed During 1916, by Provinces and Cantons*

PROVINCE AND CANTON	Census	Examined	Found Infected	Given First Treatment	Cured
Total	46,114	40,579	22,608	22,037	5,666
Provinces:					
Alajuela.....	4,370	3,477	1,967	1,950	70
Cartago.....	7,158	7,408	4,810	4,573	1,772
Guanacaste.....	11,967	8,736	6,900	6,832	1,503
San Jose.....	22,619	20,958	8,931	8,682	2,321
Alajuela:					
Alfaro Ruiz.....	1,552	1,433	925	219	19
San Carlos.....	2,818	2,044	1,742	1,731	51
Cartago:					
Paraiso.....	5,876	6,181	3,833	2,596	1,063
Turrialba (Dist. of Tuis).....	1,982	1,227	977	977	709
Guanacaste:					
Bagaces.....	1,585	1,291	1,001	996	247
Canas.....	3,856	3,295	2,780	2,752	749
Liberia.....	2,756	2,586	1,729	1,699	417
Santa Cruz.....	3,770	1,564	1,390	1,385	90
San Jose:					
Acosta.....	6,324	4,663	4,041	4,039	906
Central Office.....	16,295	16,295	4,390	4,643	1,415

tor call on the members of the school board, municipal and police officials, and other officials, and endeavor to enlist their support in the work.

Up to December 31, 1916, Table 4 shows that 614 public and school lectures had been delivered to a total attendance estimated at 37,416. There were also 11,489 special conferences at which an estimated total of 110,040 persons were present.

TABLE 4: *Costa Rica—Dispensary Work: Number of Lectures and Conferences Held in Areas Completed from September 23, 1914, to December 31, 1916, with Attendance*

With Comparison of Figures for Areas Completed During 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
1. Total Lectures.....	614	196	418
1) Public.....	157	79	78
2) School.....	457	117	340
2. Attendance at Lec- tures.....	37,416	17,955	19,461
1) Public.....	19,981	11,873	8,108
2) School.....	17,435	6,082	11,353
3. Special Conferences....	11,489	6,710	4,779
4. Attendance at Special Conferences.....	110,040	61,290	48,750

The work receives further publicity through pamphlets and leaflets which explain in simple terms the facts about the disease, give informa-

tion as to the method to be followed in taking treatment, and tell how sanitary latrines may be constructed. Notices concerning the laboratory work are also widely distributed. When a laboratory is to be opened in a new district, circular letters are mailed to the local authorities, the church officials, and prominent citizens requesting their aid in the work.

Table 5 indicates that up to December 31, 1916, a total of 143,315 pieces of literature had been distributed, of which 18,053 were booklets and 75,196 were leaflets.

TABLE 5: *Costa Rica—Dispensary Work: Number of Pieces of Literature Distributed from September 23, 1914, to December 31, 1916, by Classes*

CLASS OF LITERATURE	Up to December 31, 1916
Total.....	143,315
Booklets.....	18,053
Leaflets.....	75,196
Notices.....	31,716
Newspaper Publicity.....	368
Letters.....	3,248
Unclassified.....	14,734

Recently the high schools and colleges and the normal school of the Republic incorporated into their curricula a course on sanitary science and hygiene. Two hours weekly during the second and third years, and four hours weekly during the fourth year, will be devoted to this course. For the past one and one half years, weekly

lessons on hookworm disease and personal hygiene have been given in the primary schools. Once a month the parents are invited to these lectures. From certain of the schools reports have been received that the lectures have been influential in diminishing the amount of sickness among the pupils.

Sanitary Improvement

Costa Rica has a law, enacted in 1915, which makes it obligatory for every home to be provided with a latrine of a type approved by the Department of Ankylostomiasis. In centers of population such as the canton capitals, it is possible, by invoking the aid of the authorities, to have latrines installed and used; but in the rural districts a large staff of inspectors would be required to secure this result. In these districts, therefore, the educational work and the influence and coöperation of the public authorities are relied upon to convince the householders of the need of sanitary betterment.

Table 6 indicates that in the areas completed up to December 31, 1916, there were 9,446 homes. On the first inspection, 1,273 of these, or 13.5 per cent, were found to be provided with latrines, as compared with 4,347, or 46.0 per cent, on the last inspection. During the progress of the work, latrines were constructed at 3,074 homes, representing 32.5 per cent of the total. (See Table 6, page 182.)

TABLE 6: *Costa Rica—Dispensary Work: Homes Provided with Latrine Accommodation in Areas Completed from September 23, 1914, to December 31, 1916*

With Comparison of Figures for Areas Completed During 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Homes Inspected....	9,446	....	4,352	....	5,094	....
2. Homes with Latrines:						
1) First Inspection..	1,273	13.5	640	14.7	633	12.4
2) Last Inspection..	4,347	46.0	1,874	43.1	2,473	48.5
3. Homes Provided with New Latrines.....	3,074	32.5	1,234	28.4	1,840	36.1

Figures showing in detail, by provinces and cantons, the results of latrine building during 1916 are presented in Table 7. (See Table 7, page 183.)

In Turrialba and Escasu¹ the authorities have employed a local sanitary inspector to supervise the construction of latrines and to help in the routine work of the laboratory. After the laboratories have left these districts, the inspectors will remain to continue the work of sanitary improvement. In the former district, there are one large sugar and four large coffee estates. The owners of three of the coffee estates have built latrines for their laborers, and two have ordered off their estates all who would not be examined or who would not be treated and cured if found infected.

¹Work in this district remained in progress on December 31, 1916.

TABLE 7: Costa Rica—Dispensary Work: Homes Provided with Latrine Accommodation in Areas Completed During 1916, by Provinces and Cantons

PROVINCE AND CANTON	Homes Inspected	HOMES WITH LATRINES		Homes Provided with New Latrines
		First Inspection	Last Inspection	
Total	4,352	640	1,874	1,234
Provinces:				
Alajuela	398	51	154	103
Cartago	1,319	127	554	427
Guanacaste	2,020	448	757	309
San Jose	615	14	409	395
Alajuela:				
Alfaro Ruiz	248	26	77	51
San Carlos	150	25	77	52
Cartago:				
Paraiso	1,053	110	474	364
Turrialba (Dist. of Tuis) ..	266	17	80	63
Guanacaste:				
Bagaces	239	16	131	115
Canas	659	102	197	95
Liberia	397	269	355	86
Santa Cruz	675	61	74	13
San Jose:				
Acosta	615	14	409	395

Provision for three additional sanitary inspectors to work under the direction of the Department of Ankylostomiasis was included in the budget of the Minister of Police for 1917, which has been approved by the National Congress. These men will become available later for appointment to municipalities which may desire to employ permanent sanitary inspectors. The municipality of the Canton of Moras, furthermore, has appropriated twenty colones to be

used in constructing latrines for six poor families living in the district of Piedras Negras. This is the first municipality in Costa Rica to incur such an expenditure.

GUATEMALA

The work for the relief and control of hookworm disease in Guatemala is conducted under the direction of the Department of Uncinariasis, which is a division of the National Board of Health. On June 28, 1916, Dr. Alvin M. Struse succeeded Dr. Walter H. Rowan as Director of this department. The working staff is composed of an assistant medical director, eight technical assistants, and two clerks. Headquarters are in Guatemala City.

The work of the year 1916 has been marked by closer association with the national Government, and by increased coöperation and support on the part of the Faculty of Medicine, the National Board of Health, and the physicians of the Republic. By presidential decree the installation of latrines on all plantations, and at all schools, residences, and other buildings, was made compulsory. An official order also provides that soldiers and all pupils in the public schools shall be examined for hookworm disease, and that instruction in hygiene and public health shall be given in the schools. Governors and mayors are obligated to assist the work in all its phases.

Activities follow the dispensary plan, though in the latter part of the year effort was made to put the work on a strictly intensive basis. Plantations, or fincas, are the unit of operations.

Almost all are coffee estates, though there are a few on which sugar is raised. On the finca, conditions are peculiarly favorable for effective work against the disease: the population is concentrated within small areas, there is usually a high percentage of infection, and considerable control may be exercised over the patients while they are being examined and treated.

The medical assistant visits the different fincas on invitation from the owners and arranges for the work. One or two technical assistants are then assigned to each finca, or to a finca which serves as a base from which to conduct work on other estates in the vicinity. In their work on the estates, the technical assistants take a census, distribute containers, examine specimens, and dispense treatment.

In the work to date, approximately 9,218 of the 48,290 square miles of the country have been covered. More than four fifths of the territory covered lies in the plateau region in the southern part of Guatemala, a short distance inland from the Pacific coast. The other region is located in the department of Alta Verapaz, a rich finca section in the central part of the Republic. As a whole, the country is mountainous, except along the coastal plains on the Atlantic and Pacific sides and in the extreme northern department of El Peten. The soil is rocky and sandy; there are both wet and dry seasons; and there are marked extremes of temperature.

The estate laborers, mostly Indians, are illiterate, unsanitary in their mode of life, and in the majority of cases present severe clinical symptoms of the disease. It has not been difficult to persuade them to take treatment. The town inhabitants are more intelligent and have shown a ready willingness to coöperate in the work.

Examination and Treatment

Up to December 31, 1916, operations had been conducted on 294 fincas and in two towns. The total population of these fincas and towns, as enumerated by the staff, was 70,176. Of this total population, Table 1 indicates that 65,183, or 92.9 per cent, were examined for hookworm disease; and 41,666, or 63.9 per cent of those examined, found infected. First treatment was administered to 39,744, or 95.4 per cent of those infected; and 10,475, or 26.4 per cent of those receiving first treatment, were found negative on microscopic re-examination. The results during 1915 and 1916 are exhibited separately in the table. (See Table 1, page 188.)

Although the table indicates that the infection for the country is between 60 and 70 per cent, there are regions of low elevation, with sandy soil and a hot and moist climate, in which the infection is between 80 and 90 per cent. The zone of heaviest infection lies in the departments of Retalhuleu, Suchitepequez, and Es-

TABLE 1: *Guatemala—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from March 15, 1915, to December 31, 1916*

With Comparison of Figures for 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	70,176	....	42,086	....	28,090	....
2. Examined.....	65,183	92.9	39,596	94.1	25,587	91.1
3. Found Infected	41,666	63.9	26,665	67.3	15,001	58.6
4. Given First Treatment.....	39,744	95.4	25,961	97.4	13,783	91.9
5. Cured.....	10,475	26.4	10,475	40.3	....¹	....

cuintla, on both sides of the railroad running from Guatemala City to Ayutla.

Table 2 presents figures by departments covering the results of examination and treatment during 1916. (See Table 2, page 189.)

The figures in Tables 1 and 2 include 433 persons examined and 35 persons treated in Guatemala City. Here the infection is very light, and the work has been largely confined to the inmates of the General Hospital and to the poor. During the third quarter of 1916, a laboratory was established at the central office and placed at the disposal of the medical profession for the examination of specimens. Technical assistants in the field are also encouraged to send

¹ Not reported.

TABLE 2: Guatemala—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured During 1916, by Departments

DEPARTMENT	Census	Examined	Found Infected	Given First Treatment	Cured
Total.....	42,086	39,596	26,665	25,961	10,475
Alta Verapaz.....	9,168	7,495	5,149	5,061	.....
Amatitlan.....	369	366	128	128	.....
Escuintla.....	270	266	205	201	.....
Quezaltenango.....	1,320	1,302	733	726	.....
Retalhuleu.....	2,443	2,439	2,012	1,957	.....
San Marcos.....	1,379	1,359	676	676	.....
Solola.....	17,493	16,824	10,824	10,476	.....
Suchitepequez.....	9,367	9,340	6,916	6,714	.....
Central Office.....	277	205	22	22	.....

to the central laboratory any interesting specimens, or specimens concerning which they are in doubt.

A large part of the difference between the number of persons included in the census and the number examined represents the wandering element of the population. This is a class difficult to control. Its members seem to originate from various centers which can be named, and it is hoped that eventually, when thorough work in these centers is undertaken, it will be possible to treat these persons until they have been cured.

Educational Work

On every finca at least one lecture is delivered to the Indian laborers. The lantern slides and charts accompanying the lecture always interest the natives, even though they may not understand the language used by the speaker. Visitors are welcomed at the laboratories, and informal conferences and talks are held daily at the dispensaries and in the homes of the people. Table 3 indicates that up to December 31, 1916, 985 public and 18 school lectures had been delivered to a total of 49,287 persons. (See Table 3, page 191.)

Since the beginning of the work, 11,754 pieces of literature have been distributed, of which 4,630 pieces were distributed during 1916. This includes bulletins, posters, charts, and letters.

A special bulletin addressed to finca owners discusses the disease from an economic standpoint.

TABLE 3: Guatemala—Dispensary Work: Number of Lectures and Conferences Held from March 15, 1915, to December 31, 1916, with Attendance

With Comparison of Figures for 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
1. Total Lectures.....	1,003	536	467
1) Public.....	985	536	449
2) School.....	18	....	18
2. Attendance at Lec- tures.....	49,287	26,987	22,300
1) Public.....	48,987	26,987	22,000
2) School.....	300	....	300
3. Special Conferences....	11,776	6,253	5,523
4. Attendance at Special Conferences.....	47,949	23,949	24,000

Sanitary Improvement

The decree signed by the President during 1916 makes the construction of latrines obligatory, but the Department in conducting its work has preferred to exercise no authority. Rather, it has sought to stimulate interest to a point where voluntary coöperation could be secured. The initial survey of the fincas and towns in which work had been conducted up to December 31, 1916, showed, for a population of 70,176 persons, only 576 latrines in use. By far

the greater number of these accommodated the families of finca owners and officials. For the laborers almost no accommodation was provided.

In conference with the finca owners the wisdom of preventing soil pollution on their estates is pointed out, and their duty to provide adequate latrine accommodation for their laborers is suggested. The records show that in the course of the work on their estates, 2,694 new latrines were erected. Each latrine is usually placed at the end of a row of laborers' houses and accommodates about twenty persons. The total number of persons accommodated by the new latrines erected is approximately 47,836, or about three fourths of the total population. During 1916 alone, 1,646 new latrines were installed for the accommodation of 35,260 persons. These figures are exhibited in Table 4, which presents separately the results accomplished during 1915 and 1916.

TABLE 4: *Guatemala—Dispensary Work: Number of New Latrines Erected from March 15, 1915, to December 31, 1916*

With Comparison of Figures for 1915 and 1916

	Up to December 31, 1916	During 1916	During 1915
1. Total Latrines Found..	576	391	185
2. New Latrines Erected.	2,694	1,646	1,048
3. Persons Accommodated by New Latrines....	47,836	35,260	12,576

The figures in this table do not represent the total results accomplished in sanitary reform. During the work on the fincas, a general disease census is made; the water supply is investigated and, if necessary, suggestions for improving it are given; and effort is made to develop a public sentiment favorable to sanitary measures. Moreover, large numbers of latrines are built on some of the estates after the work of examination and treatment has ended. Figures for this work are not reported to the Department of Uncinariasis and consequently cannot be included in the record.

The indifference or active opposition of a few owners has retarded or prevented the construction of latrines on some of the estates. This is mainly responsible for the fact that, for the area of operations as a whole, the number of persons provided with latrine accommodation is not sufficient when considered in relation to the census. This difficulty may be obviated in the future under the authority conferred by the President's decree.

NICARAGUA

Measures against hookworm disease in Nicaragua are conducted by the Department of Uncinariasis, which was created in 1915 by presidential decree. During 1916, this Department remained under the direction of Dr. D. M. Molloy, aided by an assistant medical director and a staff consisting of three field directors, six technical assistants, and a secretary.

Operations follow the dispensary plan, although in some areas certain features of the intensive method have been introduced. Headquarters are in the city of Managua, where a central laboratory is maintained. Three dispensaries operate in the field. The unit of work is the town or municipality, within the jurisdiction of which certain surrounding territory is included. Effort is made to extend the work to the entire population embraced in each jurisdiction. During 1916, practically no work was done on coffee or sugar plantations.

On the Pacific side of Nicaragua, a chain of volcanic peaks runs parallel to the coast line a short distance inland, forming a great central basin and plateau region. The seven departments embraced in this territory, although comprising only one fourth the total area of the country, contain nearly 90 per cent of the inhabitants. The work, since its beginning on October 1, 1915, has been confined to the portion of this

region extending from the Gulf of Fonseca on the north to the northwestern part of Lake Nicaragua on the south.

The inhabitants of this area depend upon agriculture, trades, and commerce for their subsistence. They live almost entirely in towns, villages, or hamlets,—the majority in towns of considerable size. Relatively few people live permanently on the plantations. Almost all land is owned by large holders, the agricultural class cultivating the land as small tenants or wage-hands. Persons of mixed Indian and European descent, known racially as Mestizos, constitute about 80 per cent of the population. Full-blooded Indians, negroes, or whites are not numerous.

Examination and Treatment

In the areas in which work was conducted from October 1, 1915, to December 31, 1916, 31,570 persons were examined for hookworm disease, of whom 19,199, or 60.8 per cent, were found infected. First treatment was administered to 17,084, or 89.0 per cent of those infected. These figures are exhibited in Table 1, which presents separately the results during 1916 and during the period of three months in which operations were conducted during 1915. (See Table 1, page 196.)

In this table the percentage of infection for the work to date (60.8) does not indicate

TABLE 1: *Nicaragua—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from October 1, 1915, to December 31, 1916*
With Comparison of Figures for 1915 and 1916

	UP TO DECEMBER 31, 1916		DURING 1916		DURING 1915	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	31,570	....	26,141	....	5,429	....
2. Found Infected.....	19,199	60.8	16,518	63.2	2,681	49.4
3. Given First Treatment.....	17,084	89.0	15,473	93.7	1,611	60.1

the proportion of persons infected with hook-worm disease in the rural districts. The figures given include the examinations made at the central office at Managua, among residents of that city, inmates of the penitentiary, and recruits in barracks. The infection for the entire country, exclusive of the larger cities, is approximately 73 per cent.

Beginning with the second quarter, 1916, the free use of the laboratory at the central office was tendered to the medical profession of Nicaragua for the examination of feces. Mailing-case containers are sent to every physician who desires to avail himself of the privilege, and the results of the examination are recorded on cards sent in sealed envelopes. This service has done much to gain the good will of the physicians, from many of whom specimens are now regularly received.

Educational Work

Every one within the areas under operation is afforded an opportunity to hear the illustrated lectures; talks are given in all the schools; and informal lectures and demonstrations are held daily at the dispensaries. The parish priests usually aid the work by advising the people to coöperate, and local physicians sometimes lend their support by speaking at the public meetings.

Table 2 presents information showing the number of lectures and conferences delivered up to December 31, 1916, with figures showing the total attendance.

TABLE 2: *Nicaragua—Dispensary Work: Number of Lectures and Conferences Held from October 1, 1915, to December 31, 1916, with Attendance*

	Total for 1916 ¹
1. Total Lectures	54
1) Public	31
2) School.....	23
2. Attendance at Lectures	11,907
1) Public.....	8,775
2) School.....	3,132
3. Personal Conferences	5,056
4. Attendance at Personal Conferences	38,664

Leaflets and pamphlets have been freely distributed, and supplementary sheets added to

¹ No figures reported for 1915.

newspapers have been of great importance in spreading a knowledge of the work. These newspaper supplements, printed by the Government printing office on the regular newspaper page, are profusely illustrated and tell in detail the story of the disease. They have been distributed to the extent of 10,400 copies by seven of the leading newspapers in Nicaragua. In each case the newspaper has commented editorially on the importance of the supplement.

Figures in detail covering the distribution of literature up to December 31, 1916, are presented in Table 3.

TABLE 3: *Nicaragua—Dispensary Work: Number of Pieces of Literature Distributed from October 1, 1915, to December 31, 1916, by Classes*

CLASS OF LITERATURE	Total for 1916 ¹
Total.....	47,754
Pamphlets.....	32,750
Posters.....	8,504
Notices and Dodgers.....	6,500

Sanitary Improvement

In the towns of Nicaragua the poorer class of inhabitants, representing at least 90 per cent of the population, live in huts with dirt floors, often humid or muddy during the rainy season. These huts are usually surrounded by large yards, in which soil pollution reaches its maximum.

¹ No figures reported for 1915.

Among the middle class of inhabitants, approximately one half of the homes are provided with latrines. In many cases commodes are used, the contents of which are either dumped into the latrines, or, in the absence of latrines, into the street. The upper class of people, though relatively few in number, all have toilet accommodations, usually of the flush type.

On the sugar and coffee plantations during the few weeks of the harvesting season, large numbers of laborers are housed in barracks where almost no attention is paid to sanitation. With few exceptions, little or no effort is made to protect the health of the great mass of nomadic laborers during their temporary residence on the plantations.

Little progress was made during 1916 in improving these conditions. Only 246 new latrines were installed, which, added to the 20 reported in 1915, makes a total of 266 to date. The principal reason for the poor showing in this phase of the work is that there are no general sanitary laws compelling the people to install and use latrines. A bill now pending in the national Congress offers much encouragement, but until it is passed no definite improvement in sanitation can be expected.

PANAMA

During 1916, measures against hookworm disease in the Republic of Panama continued to be conducted by the Department of Uncinariasis, a division of the national Department of Public Works. The work received further official recognition on December 27, 1916, when the Director of the Department of Uncinariasis was made, *ex-officio*, an honorary member of the National Board of Health. On January 15, 1916, Dr. W. T. Burres succeeded Dr. L. W. Hackett as Director in charge.

The work follows the dispensary plan, with four dispensaries in constant operation: one at the central office in Panama City and three in the field. The working staff during 1916 consisted of the Assistant Director, a secretary, three technical assistants, eight microscopists, and a porter.

The Republic, with an area of 32,380 square miles, is divided into eight provinces, which are sub-divided into districts, corresponding to counties in the United States. These districts, often of considerable size, average 531 square miles in area, and constitute the unit of operations. A period of from three to six months is devoted to the work in each district. The bulk of the population consists of morenos, or natives of mixed Spanish and Indian blood, though there are large numbers of full-blooded Indians and ne-

groes, the latter being especially numerous in the Canal Zone.

In the period extending from July 15, 1914, the date on which the work against hookworm disease was undertaken in Panama, to December 31, 1916, operations had been conducted in six provinces and twenty-five districts of the Republic, including approximately two fifths of the total population of the country. Excluding the central office in Panama City, work had been completed up to December 31, 1916, in all but one of these districts. Since February, 1916, activities have been confined to the section of the country lying west of the Canal and south of the central mountain range, where the population is dense and a heavy infection exists.

Examination and Treatment

From the date of opening work on July 15, 1914, up to December 31, 1916, 60,425 persons had been microscopically examined for hookworm disease in Panama, and 43,990, or 72.8 per cent, had been found infected. First treatment was administered to 41,227, representing 93.7 per cent of the infected. Table 1 presents these figures in tabular form, and offers a comparison of the results during 1916 with those during the period of approximately eighteen months prior to 1916. (See Table 1, page 202.)

In the work conducted during the year 1916, as the table shows, 30,094 persons were examined,

TABLE 1: *Panama—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment from July 15, 1914, to December 31, 1916*

With Comparison of Figures for 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Examined.....	60,425	....	30,094	....	30,331	....
2. Found Infected	43,990	72.8	24,193	80.4	19,797	65.3
3. Given First Treat- ment.....	41,227	93.7	23,747	98.2	17,480	88.3

of whom 24,193, or 80.4 per cent, were found infected, and 23,747, or 98.2 per cent of those infected, were treated. The figures for 1916 are presented in Table 2 by provinces and districts. In the provinces and districts where the number of persons given first treatment exceeds the number found infected, the excess is due to first treatment having been given during 1916 to many persons who had been examined and found infected during 1915. (See Table 2, page 203.)

The 30,094 persons examined during 1916 represented approximately 86 per cent of the total population of the districts in which work was conducted, including the inhabitants of sparsely settled and remote mountain regions. The higher percentage of infection found during 1916 may be explained in part by a more careful technique of examination having been followed,

TABLE 2: Panama—Dispensary Work: Number of Persons Examined, Found Infected, and Given First Treatment During 1916, by Provinces and Districts

PROVINCE AND DISTRICT	Examined	Found Infected	Given First Treatment
Total.....	30,094	24,193	23,747
Provinces:			
Panama.....	1,281	429	434
Colon.....	529	494	598
Herrera.....	7,979	6,803	6,969
Chiriqui.....	10,488	9,124	7,880
Cocle.....	9,817	7,343	7,866
Panama:			
Panama.....	1,281	429	434
Colon:			
Donoso.....	529	494	598
Herrera:			
Chitre.....	698	588	806
Las Minas.....	1,505	1,285	1,264
Los Pozos.....	1,550	1,375	1,398
Ocu.....	2,910	2,502	2,465
Santa Maria.....	1,316	1,053	1,036
Chiriqui:			
David.....	4,625	3,457	2,909
Alanje.....	4,180	4,032	3,549
Bugaba.....	1,683	1,635	1,422
Cocle:			
La Pintada.....	120	116	800
Anton.....	4,981	3,684	3,561
Aguadulce.....	4,716	3,543	3,505

but more largely by the work having been conducted in towns such as Divala, Alanje, and La Pintada, where the proportion of the population infected with hookworm disease greatly exceeds the average for the country.

Although the table indicates that in Panama City, 1,281 persons were examined and 429, or 33.5 per cent, found infected, hookworm disease practically does not exist among the actual

residents of this city, owing to thorough sanitation and the universal use of shoes. The persons found infected in the work at the central office are nearly always visitors from the Interior, or local residents who have become infected during vacation or other periods spent out of town.

The most important development of the year's work was the increase in the number of re-examinations made and re-treatments administered. During 1916 the staff succeeded in administering at least two treatments to 88 per cent of the infected, as compared with 58 per cent in the period prior to 1916. This increased thoroughness is clearly reflected in Table 3, which compares the number of persons re-examined, re-treated, and cured during 1916 with the number during 1914-1915.

TABLE 3: *Panama—Dispensary Work: Number of Persons Found Infected, Given Two or More Treatments, Re-examined, and Cured from July 15, 1914, to December 31, 1916*

With Comparison of Figures for 1916 and Prior to 1916

	UP TO DECEMBER 31, 1916		DURING 1916		PRIOR TO 1916	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Persons Found Infected.....	43,990	....	24,193	....	19,797	....
2. Given Two or More Treatments	32,747	74.4	21,340	88.2	11,407	57.6
3. Re-examined.....	13,657	41.7	11,045	51.8	2,612	22.9
4. Cured.....	7,039	51.5	5,512	49.9	1,527	58.5

Educational Work

In each area in which work has been conducted, measures for educating the people along the lines of public health and sanitation play an important part. By public and private lectures, by conferences at the dispensaries, and by demonstrations and talks to school children, the purpose and scope of the work are explained.

Table 4 indicates that from July 15, 1914, up to December 31, 1916, three hundred formal lectures had been delivered to a total attendance estimated at 15,847 persons. This is exclusive of 12,979 personal conferences, at which 39,990 persons were present.

TABLE 4: *Panama—Dispensary Work: Number of Lectures Delivered and Conferences Held from July 15, 1914, to December 31, 1916, with Attendance*

With Comparison of Figures for 1916 and Prior to 1916

	Up to December 31, 1916	During 1916	Prior to 1916
1. Total Lectures.....	300	97	203
1) School.....	120	40	80
2) Public.....	180	57	123
2. Attendance at Lectures...	15,847	6,381	9,466
1) School.....	6,536	1,226	5,310
2) Public.....	9,311	5,155	4,156
3. Personal Conferences.....	12,979	7,652	5,327
4. Attendance at Personal Con- ferences.....	39,990	22,400	17,590

Letters have also been written, and posters, booklets, and leaflets distributed in all areas in which the work has been conducted. In Table 5 figures are presented showing the number of pieces of literature distributed in the work up to December 31, 1916.

TABLE 5: *Panama—Dispensary Work: Number of Pieces of Literature Distributed from July 15, 1914, to December 31, 1916*

With Comparison of Figures for 1916 and Prior to 1916

CLASS OF LITERATURE	Up to December 31, 1916	During 1916	Prior to 1916
Total.....	20,168	8,458	11,710
Letters	460	126	334
Posters	1,807	398	1,409
Booklets	1,019	772	247
Leaflets	16,882	7,162	9,720

Sanitary Improvement

While excellent results have been accomplished in the clinical and educational work, efforts to achieve concrete results in sanitary reform have thus far been unsuccessful. A few latrines have been constructed for demonstration purposes, but there are no effective laws requiring the construction of latrines, the Government has been unable to give financial assistance to the work, and it is extremely difficult to enlist the voluntary coöperation of any considerable number of the inhabitants. The attitude of the people is frequently that of actual

opposition, and in some sections even the physicians are opposed to latrines for the reason that the few that have been used in the past have been insanitary and a menace to health.

In many parts of the country the problem would be unusually difficult even if the people were in sympathy with the idea. There are large areas of lowland, in which during the rainy season the latrines would become flooded. The basic problem in these sections is one of drainage rather than of latrine construction. In certain of the larger towns the Government proposes to install septic tank systems, but these are beyond the means of smaller communities. In the absence of effective Governmental supervision, pail latrines would unquestionably be neglected.

Where the topography of the country is favorable, pit latrines are easily constructed, and prove satisfactory in use. In such sections the staff will re-double its efforts during 1917 and endeavor to obtain permanent results in the improvement of sanitation. The President has been urged to strengthen the sanitary side of the work by issuing a decree requiring the construction and use of latrines, and it is also hoped that funds will shortly become available for erecting, at schools and houses favorably situated, latrines which may serve as models to the rest of the community.

SALVADOR

On October 25, 1915, the Republic of Salvador, through its legation at Washington, extended the International Health Board an invitation to participate in measures for the relief and control of hookworm disease in that country. Acting on this invitation, Dr. John A. Ferrell, the Assistant Director General of the Board, accompanied by Dr. W. H. Rowan, at that time the Director of the work in Guatemala, visited Salvador in November, 1915. After a series of conferences with the President and members of his cabinet, and with members of the National Board of Health, a Department of Uncinariasis was organized as a bureau of the National Board of Health, and arrangements were made for undertaking operations. Headquarters were established in the city of San Salvador. Actual work was begun on March 6, 1916, under the temporary supervision of Dr. Rowan. On May 15, 1916, Dr. C. A. Bailey, who had been appointed to direct the work, arrived and assumed active charge of operations.

Both the dispensary and intensive plans of work have been followed. A town or an estate is the unit of operations. Here the intensive method is applied. Persons who come to the laboratory from districts surrounding the towns and estates are examined and treated by the dispensary method. In the reports, however, the

results accomplished by the respective methods have not been shown separately, so that for the present the entire work in Salvador is classed as being of the dispensary type. The working staff consists of an assistant director, nine microscopists (four of whom are medical students, designated assistant field directors), and one secretary.

To date the work has been confined to the department, or state, of San Salvador. At the suggestion of the central Government, activities were inaugurated in the capital city among the soldiers and government employes, and in the schools and public institutions. The first field laboratory was opened in August in the town of Apopa; by the end of the year there were five field laboratories in operation. The work in Apopa was concluded in December. This was the only field area in which operations had been concluded by the end of the year.

Examination and Treatment

The total population of the districts in which work had been conducted up to December 31, 1916, was 11,727. As will be seen from Table 1, 9,975, or 85.1 per cent, of these persons were examined for hookworm disease; and 3,444, or 34.5 per cent of those examined, were found infected. First treatment was administered to 2,946, representing 85.5 per cent of those found infected; and 1,311, or 44.5 per cent of those receiving first treatment, were cured.

TABLE 1: *Salvador—Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured from March 6, 1916, to December 31, 1916*

	TOTAL FOR 1916	
	Number	Per Cent
1. Census.....	11,727	....
2. Examined.....	9,975	85.1
3. Found Infected.....	3,444	34.5
4. Given First Treatment.....	2,946	85.5
5. Cured.....	1,311	44.5

The percentage of infection is comparatively low, owing to the large number of persons examined and found negative in the city of San Salvador. The infection varies considerably in different localities and among different groups of persons. For instance, in a group of military recruits belonging to the cavalry, who were taken from many sections of the Republic, an infection of 89 per cent was found; at Apopa the infection was 51 per cent; and on two coffee plantations, situated on the slope of an extinct volcano, where climatic conditions are especially favorable for the spread of the disease, the infection was 76 and 67 per cent, respectively.

The removal of members of the military force, of the national guard, and of the municipal police from the field of operations after one or more treatments had been given but before re-

examination could be made, is responsible for the small percentage of persons recorded as cured. There were also many persons treated once or twice under the dispensary plan who did not return for re-examination.

Figures in detail showing the results of examination and treatment up to December 31, 1916, are presented in Table 2.

TABLE 2: *Salvador—Dispensary Work: Detailed Results of Examination and Treatment from March 6, 1916, to December 31, 1916*

	Total for 1916
1. Census.....	11,727
2. Examined.....	9,975
3. Not Examined.....	1,752
1) Refused.....	545
2) Removed.....	42
3) To be examined.....	1,165
4. Found Infected.....	3,444
5. Given First Treatment.....	2,946
6. Not Given First Treatment.....	498
1) Refused.....	106
2) Removed.....	78
3) Medical reasons.....	35
4) To be given first treatment.....	279
7. Cured.....	1,311
8. Given First Treatment but Not Cured.....	1,635
1) Refused.....	263
2) Removed.....	499
3) Medical Reasons.....	21
4) Under Treatment.....	849
5) Died.....	3

Educational Work

Educational work is conducted through the schools, by public and special lectures, and through the press. Public lectures illustrated by the stereopticon are held in every district in which laboratories are established, and private talks are given in the houses when the census is taken. Microscopic demonstrations of eggs and larvae are also frequently given in the laboratories and houses.

The results of lecture work are summarized in Table 3. The special lectures include talks to soldiers, municipal employes, and prisoners in the penitentiary. Talks with small groups in the laboratory and houses are classed as personal conferences.

TABLE 3: *Salvador—Dispensary Work: Number of Lectures and Conferences held from March 6, 1916, to December 31, 1916, with Attendance*

	Number
1. Total Lectures.....	32
1) Public.....	15
2) School.....	7
3) Special.....	10
2. Attendance at Lectures.....	7,223
1) Public.....	3,398
2) School.....	975
3) Special.....	2,850
3. Personal Conferences.....	960
4. Attendance at Personal Conferences.....	3,281

Literature, consisting of letters, illustrated pamphlets, handbills, and posters, has been distributed in every department of the Republic. Table 4 indicates that the total number of pieces of literature distributed up to December 31, 1916, was 5,010.

TABLE 4: *Salvador—Dispensary Work: Number of Pieces of Literature Distributed from March 6, 1916, to December 31, 1916, by Classes*

CLASS OF LITERATURE	Number of Pieces Distributed
Total.....	5,010
Letters.....	100
Leaflets.....	4,760
Bill Posters.....	105
Notices.....	45

Sanitary Improvement

During the early months of the work, operations were confined entirely to the city of San Salvador. Here there is a sewer system, which prevents to a large extent the spread of hook-worm disease. In the rural regions, however, soil pollution is almost universal and sanitation is one of the greatest needs. For instance, in the areas in which operations had been conducted up to December 31, 1916, among a total of 558 homes, only 39, or 6.9 per cent, were provided with latrines. In many rural districts, furthermore, conditions are peculiarly favorable for spreading the disease.

Throughout the Republic there are many coffee and sugar estates. On the former the conditions favoring the spread of hookworm disease are well recognized. On sugar plantations, latrine accommodations are absent, but the altitude is lower and the soil is not so well shaded nor so moist, especially during the dry season, when the sugar cane is harvested. The disease, therefore, is not so rife. The native laborers, however, often migrate back and forth between the two kinds of estates, being engaged today in picking coffee and tomorrow in harvesting cane.

Efforts at sanitary improvement during the year have had to rely on education and persuasion unbacked by legislation. Under these conditions very little progress has been made. It seems that there should be a special sanitary enactment compelling house owners to construct latrines under the supervision of the Department of Uncinariasis, with provision for municipal assistance in cases of poverty, and with a penalty for non-compliance. There is every prospect that during the coming year such a law will be passed by every department in the country.

CEYLON

During 1916 the International Health Board began active participation in measures for the relief and control of hookworm disease in Ceylon. The work in this colony is conducted as a branch of the Government Medical Department, under the supervision of Dr. G. J. Rutherford, Principal Civil Medical Officer. Control is vested in a local Ankylostomiasis Committee, composed of the Colonial Secretary, the Principal Civil Medical Officer, members of the Estate Agents' and Planters' Associations, and prominent medical men of the colony. Of this committee the Colonial Secretary is chairman.

Efforts to eradicate the disease from Ceylon have been made for a number of years. At the time of the visit of the Director General of the International Health Board in 1914, definite plans for bringing the disease under control were formulated. These plans provided for the work to be conducted entirely by local agencies, the expense to be shared equally by the Government and the planters. Because of conditions growing out of the war, however, this project had to be abandoned soon after it was begun.

Later, on May 26, 1915, during the visit of the International Health Board's Director for the East, arrangements were made for resuming measures for the control of the disease with the coöperation of an officer of the Board. Active

work was begun on January 12, 1916. At first the staff consisted of a Director, an assistant medical director, six apothecaries, and one caretaker, with all expenses, exclusive of the salary and personal allowance of the Director, borne equally by the Government and the planters.

Later, in accordance with a new arrangement made by Dr. H. H. Howard, the Board's Director for the West Indies, who had been delegated to assist in organizing the work in Ceylon, the staff was enlarged to include a Director, an assistant medical director, three junior field directors (in training), four microscopists, twelve nurses, two clerical assistants, and one caretaker. Six of the nurses speak Tamil and English and four Sinhalese and English, while two are Moors engaged to handle the Moorish population in the villages. This division represents roughly the proportion of these elements of population. Under the new arrangement, the cost of the work is divided between the Government and the Board. From October 18 until the end of the year, the work in Ceylon was directed by Dr. W. Perrin Norris, Associate Director for the East, with Dr. John E. Snodgrass in direct charge of operations in the field.

The Matale district, located in the central part of the Island about seventy-five miles from Colombo, the capital, was chosen for initial operations. Roughly, this area is seven by ten miles in extent. Included within its boundaries

are twenty-four rubber and tea estates, and from forty to fifty towns, villages, and hamlets. The estate population numbers about 8,000 and averages one person to the acre; the village population is approximately 18,000. The district is mountainous, and large portions of it can be reached only on foot; on one estate, certain of the coolie lines are about five miles apart and difficult of access, as the estate extends over a mountain range.

Both the intensive and dispensary plans have been followed in the work to date. On the estates, where it is possible to exercise a considerable degree of control over the coolies while they are being examined and treated, and in the villages, the operations have been of the intensive type. In two of the villages, however, Alawatagoda and Wilane, in which operations were begun during the month of April, many obstacles, most of them of a religious nature, were encountered, and the work finally had to be abandoned before being completed. Examination and treatment by the dispensary method was carried out in the central office at Matale and in the village of Katugastota.

Up to December 31, 1916, operations had been brought to a close on ten estates and in the villages of Alawatagoda and Wilane, while work was in progress on five other estates and in four other villages, as well as in four schools and one college.

Examination and Treatment

In the areas in which work by either the intensive or dispensary method had been completed up to December 31, 1916, a total of 7,645 persons was examined, of whom 7,358, or 96.2 per cent, was found infected. First treatment was administered to 6,752 persons, or 91.8 per cent of those found infected, and 3,631, or 53.8 per cent of those given first treatment, were cured. These figures are shown in Table 1, which compares the results accomplished by the intensive and dispensary methods. (See Table 1, page 219.)

The figures in this table include the examination of 170 Europeans, only 25 of whom were found to be infected. Excluding these from the calculations, the percentage of infection rises to 98.1. This is the highest percentage encountered in any country with which the International Health Board has been coöperating. The degree of individual infestation is also very great, requiring on the average a large number of treatments to effect a cure.

The table shows that the intensive work was much more effective on the estates than in the villages. In addition to religious opposition, which leads the adherents of one faith instinctively to oppose measures in which the adherents of another faith are participating, the villagers have the fixed belief that it is dangerous to take a purgative during wet weather; and as

TABLE 1: *Ceylon—Intensive and Dispensary Work: Number of Persons Examined, Found Infected, Given First Treatment, and Cured During 1916*

With Comparison of Results by the Intensive and Dispensary Methods

	TOTAL FOR 1916		INTENSIVE WORK						DISPENSARY WORK	
			Total		Estates		Villages			
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
1. Census.....	..	....	4,779	....	3,761	....	1,018	....	....	....
2. Examined.....	7,645	....	4,567	95.6	3,697	98.3	870	85.5	3,078	....
3. Found Infected.....	7,358	96.2	4,493	98.4	3,647	98.6	846	97.2	2,865	93.1
4. Given First Treatment.....	6,752	91.8	4,101	91.3	3,568	97.8	533	63.0	2,651	92.5
5. Cured.....	3,631	53.8	3,190	77.8	2,938	82.3	252	47.3	441	16.6

a large proportion of the days are more or less rainy, this constitutes a serious hindrance to the work. Many lightly infected Sinhalese villagers have also declined to be treated, claiming they felt no ill effects from their infection.

The effectiveness of the intensive work in reducing the number of persons infected with hookworm disease on the estates and in the villages, is exhibited in Table 2. This shows that on the estates only 4.7 per cent of the persons originally found infected remained uncured when the work of examination and treatment ended. Practically all of these were persons who could not be treated or cured for medical reasons.

TABLE 2: *Ceylon—Intensive Work: Number of Persons Remaining Uncured on Estates and in Villages Completed During 1916*

	TOTAL		ESTATES		VILLAGES	
	No.	P. C.	No.	P. C.	No.	P. C.
1. Infected.....	4,493	....	3,647	....	846	....
2. Cured.....	3,190	71.0	2,938	80.6	252	29.8
3. Removed.....	651	14.5	537	14.7	114	13.5
4. Remaining in Area Uncured.....	652	14.5	172	4.7	480	56.7
1) Refused.....	422	9.4	61	1.7	361	42.7
2) Medical Reasons	107	2.4	107	2.9	.....	....
3) Under Treatment	123	2.7	4	.1	119	14.1

The fact that the estate laborers move about more or less continuously is evidenced by the large number of infected laborers (537, or 14.7

per cent of the total) who removed from the estates while the work was going on. This militates strongly against the best results being obtained in the work of examination and treatment. On one estate employing a force of about 275 men, on which work had been conducted up to September 4, 1916, the superintendent stated that at the end of the year there remained not more than 30 to 40 per cent of those who had

TABLE 3: Ceylon—Intensive Work: Detailed Results of Examination and Treatment on Estates and in Villages Completed During 1916

	Total	Estates	Villages
1. Census	4,779	3,761	1,018
2. Examined	4,567	3,697	870
3. Not Examined	212	64	148
1) Refused.....	80	....	80
2) Removed.....	128	60	68
3) Died.....	4	4	....
4. Found Infected	4,493	3,647	846
5. Given First Treatment	4,101	3,568	533
6. Not Given First Treatment	392	79	313
1) Refused.....	210	....	210
2) Medical Reasons.....	68	68	....
3) Removed.....	110	7	103
4) Died.....	4	4	....
7. Cured	3,190	2,938	252
8. Given First Treatment but Not Cured	911	630	281
1) Refused.....	212	61	151
2) Medical Reasons.....	39	39	....
3) Removed.....	520	509	11
4) Died.....	17	17	....
5) Under Treatment.....	123	4	119

been treated. In their places, new, and presumably infected, laborers had been employed, thereby increasing the likelihood that those who had been cured would be re-infected.

The detailed results of examination and treatment by the intensive method are shown in Table 3. (See Table 3, page 221.)

Educational Work

Extensive publicity has been obtained through the press and by means of lectures and the distribution of literature. Table 4 shows that up to December 31, 1916, 43 lectures had been delivered to a total attendance estimated at 6,005 persons, and that 118 house-to-house talks, attended by an estimated total of 1,565 persons, had been delivered.

TABLE 4: *Ceylon—Intensive and Dispensary Work: Number of Lectures and House-to-House Talks Delivered During 1916, with Attendance*

	Total for 1916
1. Total Lectures	43
1) Public.....	24
2) School.....	12
3) Special.....	7
2. Attendance at Lectures	6,005
1) Public.....	3,797
2) School.....	1,699
3) Special.....	509
3. House-to-House Talks	118
4. Attendance at House-to-House Talks	1,565

In addition, more than 3,500 leaflets in English, Sinhalese, and Tamil were distributed on the estates and in the schools, and more than 1,900 letters were mailed. The most far-reaching work of this kind was the publication by the newspapers and journals of special articles and editorials on the subject of hookworm disease. A popular article published in the *Kandyan Journal*, a native newspaper, was translated into English for distribution to estates, and into Sinhalese for distribution to schools. It is estimated that this article alone reached about 600,000 persons. Another popular article was issued in leaflet form by the Government Medical Department, and a copy sent to every estate in the colony with the suggestion that it be read to the laborers twice weekly at muster. A more comprehensive and technical article, published originally in the *Planters' Journal*, was re-published as a pamphlet and distributed among the medical profession.

Early in the year arrangements were made to receive at the office in Matale, for training in microscopic technique, a limited number of medical dispensers from various estates. So great was the interest in this work that only a small proportion of those who applied could be accommodated. However, fifty-one men, representing nearly every planting district in Ceylon, were given instruction for periods varying from seven to fifteen days each.

Sanitary Improvement

A sanitary survey made at the beginning of operations showed that none of the ten estates on which the work was completed during 1916, were provided with latrine accommodations for their laborers, while in the Alawatagoda and Wilane villages only 9 latrines were found at 274 homes. In April the Senior Sanitary Officer detailed a sanitary officer and two inspectors to supervise the installation of latrine accommodations in these villages. They encountered many difficulties, but were able during the progress of their work to have 184 additional homes provided with satisfactory latrines, leaving only 81 still to be provided. This work is being continued.

During November, the Government passed rules in connection with an existing ordinance, making it compulsory for all estates to provide adequate latrine accommodations for their laborers within the period of one year. Previously it had made provision for two medical inspectors to have charge of estate sanitation. Neither of these positions, however, was filled during the year. The Senior Sanitary Officer has no authority to supervise estate sanitation. No sanitary officer, therefore, was available to give attention to this branch of the work. It is expected that in the near future the Senior Sanitary Officer will be given authority to supervise both estate and village sanitation. Nearly all the estate

superintendents are anxious to install latrines, but lack information as to the most suitable type. During the year, 51 composite latrines, having a total of 302 compartments, were constructed for use on the ten estates. This work will undoubtedly proceed until sufficient accommodations have been provided for all the laborers.

III. TECHNIQUE OF EXAMINATION AND TREATMENT

I

MICROSCOPIC EXAMINATION

In British Guiana, St. Lucia, and Nicaragua during 1916, experiments were conducted for determining the importance of the centrifuge in preparing specimens for examination, as well as for indicating the proper number of slides to be examined from each specimen before and after it is centrifuged. In Nicaragua the examination of 319 recruits for the army showed that 6.9 per cent persons were recorded as positive after their specimens had been centrifuged who would have been recorded as negative if the centrifuge had not been used. The figures are as follows:

	<u>Number</u>	<u>Per Cent</u>
Recruits examined.....	319	....
Positive on first slide before centrifuging.....	217	68.0
Positive on second slide before centrifuging.....	44	13.8
Positive on first slide after centrifuging.....	16	5.0
Positive on second slide after centrifuging.....	6	1.9

Approximately the same result was obtained on re-examination after treatment, when 7.9

per cent additional specimens were recorded as positive after being centrifuged.

In British Guiana it had been the custom to examine seven 2 x 3" slides before centrifuging, and seven additional slides after centrifuging, before pronouncing any specimen negative. During the year, tests were made to ascertain if so thoroughgoing a technique was required to detect practically all of the infected cases. Three smears were made from each specimen and examined. If no eggs were found an emulsion was made and centrifuged, and three additional slides examined. From the same specimen seven slides were then made, and if no eggs were found an emulsion was made and centrifuged, and seven additional slides examined. Two thousand specimens were examined in this way. It was found that by the short technique the results were the same as by the long, with the exception of two specimens. In these the result was negative by the short method and positive by the long. In other words, the extra eight slides which were examined (four before and four after centrifuging) resulted in the finding of only two additional positive specimens,—showing that in the examination by the short method there was an error of only one tenth of one per cent.

In St. Lucia a census of 2,662 persons was handled, with an infection of 47 per cent, and including all necessary subsequent examinations

only three instances were found in which infection was recorded on the third slide examined after centrifuging. It was therefore decided that the examination of two slides after centrifuging was sufficient for practical purposes.

These experiments in British Guiana and St. Lucia during 1916 confirm the tests carried out in Trinidad during 1915, in which, among a total of 1,434 specimens examined, 895 were found positive by the examination of two slides before and two after centrifuging. On the third slide examined after centrifuging, not one additional positive specimen was recorded.

II

TREATMENT

Further experiments as to the value of oil of chenopodium in the treatment of hookworm disease were conducted during the year. The efficacy of this drug was tested under varying conditions of administration, in doses of different sizes, and in certain instances studies were made of its value in comparison with thymol and beta-naphthol. Practically all reports agree that oil of chenopodium is the most effective remedy for expelling *Ascaris*, and that it is more active than thymol in the treatment of infection with *Oxyuris* and *Trichocephalus*. As to its value in the treatment of hookworm infection, however, the reports received have been con-

flicting in character,—the result, perhaps, of differences in the strength and potency of the drug, in the laboratory technique employed, or in the methods of administration.

Alarming symptoms, and sometimes death, have been reported in the Southern States, the West Indian colonies, Panama, Nicaragua, Ceylon, and Egypt following the administration of the drug in accordance with accepted methods of treatment, and in nearly every instance in less than the maximum dose. Extreme caution in the use of the drug is therefore indicated until its proper method of preparation has been learned, its chemical composition and stability standardized, and a safe dosage and method of administration established. The fact that the drug is a powerful poison, often uncertain in action under conditions at present attending its preparation and administration, should lead all medical officers to be extremely discriminating in its use.

In administering the drug in Nicaragua, Dr. Molloy reports that no arbitrary dosage has been followed. The dose recommended by Dr. Schüffner, 1.00 gram to 1.20 grams as the maximum (15 to 18 minims), was followed for a while, but this was found to be insufficient under ordinary conditions. The dose was finally increased to a maximum of 2.00 grams (30 minims). In none but very exceptional cases was a dose of 3.00 grams (recommended by some physicians

in the Far East) prescribed in a dispensary. The maximum dose which can be safely prescribed in dispensaries operating in Central America, where the average weight is about 120 pounds, is believed by Dr. Molloy to be 2.00 grams.

As a rule the dose is proportioned according to age, as follows: Two drops for each year of age to the age of 24, 48 drops being considered the maximum. This amount of the ordinary oil of chenopodium, dropped from a dropping bottle, weighs approximately 2.00 grams. This dose is always given in two or three equal parts, with an hourly, or two-hourly, interval between portions (two hours if given in two equal parts, or one hour if given in three equal parts).

The mode of administration followed is essentially as follows: All solid food is prohibited after the midday meal the day before administering the drug. At 4 p. m. of this day, the patient is given a cleansing purge of Epsom salts. By giving this preliminary purge at 4 o'clock, the necessity of having to get up during the night is avoided, since the purgative will have acted, as a rule, before bed-time.

At 6 o'clock the following morning, before any food is eaten, the first portion of sugar containing the chenopodium is taken, followed by the remainder at hourly or two-hourly intervals. Two hours after the last of the chenopodium, a good dose of Epsom salts (usually a little more

than an ounce for adults) is taken to expel the worms. This is repeated, if necessary, in two hours.

During the last quarter of the year, a series of experiments was begun in Nicaragua to determine the efficacy of chenopodium treatment under given conditions and in given doses. These experiments are still under way, and will be continued until a large number of cases have been treated.

Chenopodium oil, alone, is being used as the basis of treatment. Chenopodium oil mixed with a sufficient amount of oil of eucalyptus to disguise its unpleasant taste and odor (three parts chenopodium and one part eucalyptus) and chenopodium in capsules, are also being used. These treatments are being given to the recruits of the Nicaraguan army, are personally administered by a technical assistant, and all examinations are made with the use of the centrifuge. Data on the treatment of 140 cases to date reveal the results shown in Table 1, page 232.

While this series is too small for drawing deductions, it would seem to indicate that the addition of 25 per cent of oil of eucalyptus adds to the efficiency of the drug (51.4 per cent of cures resulting from one treatment, as against 48.6 per cent from one treatment with oil of chenopodium alone).

In Salvador, oil of chenopodium, given usually in capsules, and thymol with equal parts of

TABLE 1: *Nicaragua—Results of Re-examination of 140 Cases at End of Two Weeks Following Treatment with Oil of Chenopodium*

	METHOD OF TREATMENT			
	All Methods	Oil of Chenopodium Dispensed in Sugar (Maximum Dose 48 Drops)	Oil of Chenopodium Three Parts, Eucalyptus One Part (Maximum Dose 48 Drops)	Chenopodium in Capsules (30 Minims Maximum Dose)
1. Total Cases Treated.....	140	37	74	29
2. Cases Cured with One Treatment.....	63	18	38	7
	45.0	48.6	51.4	24.1
3. Cases Remaining Positive after One Treatment.....	77	19	36	22
1) Positive First Slide Before Centrifuging.....	47	12	20	15
2) Positive Second Slide Before Centrifuging.....	19	5	9	5
3) Positive First Slide After Centrifuging.....	8	2	5	1
4) Positive Second Slide After Centrifuging.....	3	0	2	1

sugar of milk, also administered in capsules, are the drugs which have been used. In some instances both oil of chenopodium and thymol have been given to the same patients. When chenopodium is taken the preliminary purge is omitted, a dose of Epsom salts being given in the majority of cases following the last dose of chenopodium. No re-examinations are made in less than one week following the last treatment; in most cases, a longer period is allowed. The centrifuge is used, two slides being examined before and two after centrifuging.

In this country, experiments were conducted as to the relative efficiency of three methods of treatment—that is, oil of chenopodium alone, thymol alone, and one dose of oil of chenopodium followed by thymol for the second and for all subsequent treatments. These experiments, however, have not progressed sufficiently to draw positive conclusions. From the investigations so far conducted it would appear that with fifteen drops of oil of chenopodium administered every one or two hours for three doses, followed by castor oil, a larger number of persons are cured with two treatments than when thymol is administered. The following comparison of the results obtained in two districts, in one of which thymol was used and in the other oil of chenopodium, is offered by Dr. Bailey to substantiate this tentative conclusion:

Apopa		El Angel	
Treatment: Thymol Only		Treatment: Oil of Chenopodium Only	
Census.....	1,024	Census.....	675
Microscopically examined..	903	Microscopically examined..	619
Positive to uncinariasis...	457	Positive to uncinariasis....	376
Per cent infection.....	50.6	Per cent infection.....	60.7
Received second exami- nation.....	356	Received second exami- nation.....	239
Cured.....	210	Cured.....	150
Per cent cured.....	59.0	Per cent cured.....	62.8

In three laboratories operating in Panama, thymol is used; in one, chenopodium. Each drug is reported as having its advantages. At the close of the third quarter, 1916, a change to the exclusive use of chenopodium was being considered, but during the last quarter the results obtained by the laboratory using chenopodium were unsatisfactory. The cause may have been faulty technique on the part of the new microscopists employed in that laboratory, the drug may have been poor in quality, or there may have been some other cause not yet determined.

In administering the drug in Guatemala, a mathematical table of dosage is not adhered to. The minimum dose is 0.65 c.c.; the maximum, 3.00 c.c. To a child below ten years, either the minimum dose is given or the dose is increased according to the physical condition of the child; to an average adult, 2 c.c. is given; and to a strong, vigorous male, the maximum dose. At each treatment the dose is divided into three portions, with one hour intervals. Two hours following the last dose, a purge of sodium sul-

phate is administered. The chenopodium is given in sugar, in molasses, or in honey. It is administered in the early morning, and the patient is able to take his treatment and perform his day's work. During 1916, three days were allowed to elapse between treatments. Three days after the second treatment had been administered the patient was re-examined.¹ Three slides were carefully examined before the specimen was pronounced negative. The centrifuge, however, was not used.

In Costa Rica, Dr. Schapiro reports that chenopodium is used in preference to thymol. The following table indicates the maximum dose, according to apparent age and 80 per cent hemoglobin, as administered in that country. The maximum dose, however, is reduced according to the physical development of the patient and the percentage of hemoglobin in his blood.

<u>Age Years</u>	<u>Dose Drops²</u>
2.....	1
3.....	3
4.....	4
5.....	6
6.....	8
7.....	10
8.....	12

¹ This interval between treatment and re-examination is believed by most authorities to be too brief. It has been established that because of the action of chenopodium in inhibiting the laying of eggs by female hookworms, an interval of at least ten days should elapse between treatments.

² Dropped from medicine-dropping bottle; 15 drops=0.46 c.c.

<u>Age Years</u>	<u>Dose Drops</u>
9.....	14
10.....	16
11.....	18
12.....	20
13.....	22
14.....	24
15.....	26
16.....	28
17.....	30
18.....	32
19.....	34
20 to 50.....	36
Over 50.....	26

The drug is administered in a mixture of equal parts of syrup of brown sugar and strong extract of coffee. Dr. Schapiro reports that by this means it is more easily taken, the disagreeable taste is masked, and the dizziness frequently following its administration is practically eliminated, so that the patient can return to his home to take the second purge.

In the West Indies, less satisfactory results have been reported from the use of chenopodium. In Trinidad, the drug was used in lieu of thymol in one district, the conditions in which differed in no way from those in other districts. The work in this district was opened by one of the most successful nurses, and later, when he had to be taken to another field, it was always possible to have an unusually good nurse to administer treatment. Work in this district was begun on April 2, 1916, and the last treatments were given

September 29, 1916, the work being carried on for a period of practically six months.

The drug used was supplied in bulk by the medical storekeeper of this colony. The name of the manufacturer could not be learned. It was carefully measured in capsules of proper size and sealed in the office, under the direction of the Medical Officer in Charge. The drug was used the same week that it was encapsulated.

The dosage was 21 minims for an adult male or large female, and 17 minims for the average female. Children received one minim for each year of age. A purge, magnesium sulphate, was administered the night before the oil of chenopodium was taken. One third of the dose of oil of chenopodium was administered at 6 a. m., a like amount at 7 a. m., and the last portion at 8 a. m. At 10 a. m. a second purge of magnesium sulphate was given. The patient was required to fast until noon. It was necessary to use magnesium sulphate instead of castor oil, because in Trinidad there is an exceedingly strong local prejudice against the latter and it is practically impossible to induce persons of the lower class to take it.

The centrifuge was used in re-examining specimens, two slides being examined before and two after centrifuging. Specimens were collected for re-examination on the sixth day after each treatment. If positive, the patient received

another treatment the following day. If negative, another specimen was obtained on the eleventh day or later. No patient was pronounced cured unless his stool was free of eggs at least eleven days after treatment. Sixty-three specimens taken six or seven days after treatment were negative on microscopic examination; twenty-five specimens taken from five to ten days later from the same patients were positive. This apparently indicates that many worms which are not actually killed by the drug have their reproductive functions interfered with in such manner that it is many days before they resume laying eggs. Therefore, the ordinary method of examining a patient six days after treatment is not believed to be sufficiently accurate when this drug is employed.

Patients still positive after five successive treatments with oil of chenopodium were given thymol for the sixth and seventh treatments, after which the use of chenopodium was continued. There were 127 patients cured in this district, of whom 112 required less than six treatments. Four were cured by the sixth and four by the seventh treatments, in which thymol was administered. Of the other seven persons cured, four were cured after the eighth treatment, one after the tenth, and two after the twelfth, in all of which chenopodium was used. This is shown in the following summary:

<u>Number of Treatments</u>	<u>Number of Persons Cured</u>
All Treatments	127
First treatment	24
Second treatment	35
Third treatment	27
Fourth treatment	18
Fifth treatment	8
Sixth treatment	4
Seventh treatment	4
Eighth treatment	4
Ninth treatment	0
Tenth treatment	1
Eleventh treatment	0
Twelfth treatment	2

There were no very serious effects of the oil on any of the patients. The most serious mishap was collapse in a child of three, on whom the second dose of magnesium sulphate had had no effect. She recovered after a dose of castor oil. There were, however, an extraordinary number of complaints from this district, complaints which, while petty in themselves, had a great influence in preventing further treatment of the patients and their friends. These complaints were of dizziness and weakness, which lasted two or three days after treatment. There was also the well-known symptom of tingling in the palms of the hands. This was described by the patients as "a heat," and seemed to have an unfavorable psychic effect on them. The combined effect of these petty complaints was to compel the medical officer and chief nurse to spend a great deal of their time in this district

reassuring the patients and urging them to continue treatment.

The statistics for this district, in comparison with the average for sixteen districts in which thymol exclusively was used, are given in Tables 2 and 3. (See Tables 2 and 3, page 241.)

In the district in which chenopodium was used, a much greater effort was required on the part of the nurse and director to induce the patients to take treatment than in the district in which thymol was employed. Because of this additional effort, the nurse could not handle so many patients at a time. The nurse's work was further increased by the additional number of specimens that it was necessary to collect, and was delayed by the long time which had to be allowed between the treatment and re-examination of each patient. These considerations are aside from the possible dangers of the drug, as shown by two cases of collapse in the Trinidad campaign (one was reported in 1915). With thymol, in an experience many times as great, no such accidents were recorded in the Trinidad work.

Chenopodium was used in almost all districts in Grenada from August 26 until the close of the year, because of inability to obtain a supply of thymol. The average adult dose was twenty minims: ten minims at 6 a. m. and ten at 8 a. m. Epsom salts was administered the night before treatment, as well as two hours after the

TABLE 2: *Trinidad: Comparison of Results Obtained in One District Treated with Chenopodium with the Average Results Obtained in Sixteen Districts Treated with Thymol*

	OIL OF CHENOPODIUM (1 District)		THYMOL (Average for 16 Districts)	
	Number	Per Cent	Number	Per Cent
1. Census.....	231	....	406	....
2. Examined.....	222	96.1	371	91.4
3. Found Infected.....	182	82.0	250	67.4
4. Given First Treatment....	165	90.7	227	90.8
5. Cured.....	127	77.0	170	74.9
6. Total Number of Treatments Given.....	405	....	609	....
7. Average Number of Treatments Per Cure.....	3.19	....	3.58	....

TABLE 3: *Trinidad: Cumulative Summary Showing Number of Persons Cured after Successive Treatments: Comparison of Results Obtained in One District Treated with Chenopodium with the Average Result for Sixteen Districts Treated with Thymol*

	OIL OF CHENOPODIUM (1 District)		THYMOL (Average for 16 Districts)	
	Number	Per Cent	Number	Per Cent
1. Total Number of Persons Cured.....	127	....	170	....
2. Number of Persons Cured After:				
1) Two Treatments.....	59	46.5	78	45.9
2) Four Treatments....	104	81.9	125	73.5
3) Six Treatments.....	116	91.3	156	91.8

last dose of chenopodium had been taken. One district was treated with beta-naphthol for purposes of comparison.

In all cases two treatments not less than one week apart were administered before re-examination. If the patient remained uncured, two more treatments were administered before the next re-examination. The cases remaining uncured after four treatments were treated with thymol. In all cases the medicine was swallowed in the presence of the nurse.

As to the comparative efficacy of oil of chenopodium and beta-naphthol, the figures in Table 4 indicate that 47.3 per cent of those examined after two treatments with oil of chenopodium were found to have been cured, as compared with 25.8 per cent of those examined after two treatments with beta-naphthol. Of those examined after four treatments, the table shows that 58.3 per cent of those treated with chenopodium were found to have been cured, as compared with 36.2 per cent of those treated with beta-naphthol. Inasmuch as thymol was used for treating all cases remaining uncured after four treatments, no data were secured as to the establishment of tolerance to chenopodium,—which in many cases has been urged as an objection to the use of this drug. (See Table 4, page 243.)

The principal objection noted to the use of oil of chenopodium in Grenada is the loss of

TABLE 4: Grenada—Comparative Efficacy of Chenopodium and Beta-Naphthol: Results of Re-examination after Two Treatments and after Four Treatments

	Examined After 2nd Treatment	Cured After 2nd Treatment	Percentage Cured After 2nd Treatment	Examined After 4th Treatment	Cured After 4th Treatment	Percentage Cured After 4th Treatment
Beta-Naphthol Cases.....	93	24	25.8	58	21	36.2
Oil of Chenopodium Cases..	241	114	47.3	156	91	58.3

more than a week between treatments, due to the necessity of waiting fourteen days to obtain a specimen for re-examination. This necessity was indicated by the re-examination of 55 cases which had been re-examined from six to thirteen days following treatment and found negative. All fifty-five of these cases were again re-examined at the end of fourteen or more days after treatment, and twelve of the cases were found to be positive. In the re-examination of specimens the same technique was followed as in Trinidad.

Dr. Colwell reports that distaste for the drug and irritating symptoms are more marked with chenopodium than with thymol. The symptoms noted are mainly dizziness and faintness, which may continue for several days. No serious or permanent symptoms have been observed.

In St. Lucia a trial of chenopodium was made with liberal samples of five and ten-minim capsules. A small area was chosen, having a census of 92, of whom 41, or 44 per cent, were infected. One person left the locality before treatment was started.

The dosage adopted for adults (16 years and upwards) was three capsules of ten minims each: one capsule every half hour, followed by a dose of Epsom salts after the third capsule. On the evening before the chenopodium was administered, a dose of salts was given. The dose of

salts following the capsules was graduated according to the effects that had already been produced. To children 9 to 15 years of age, three capsules of five minims each were given, with still smaller doses for those who were younger.

No complaints were heard other than of an occasional heavy purgation. The activity of the oil in expelling roundworms was often a source of gratification to the patient or parent. Of the 40 who took the first treatment, 29 were registered as cured as the result of the treatment; 7 were cured after two treatments; 3 required a third; and one is doubtful, not having yet taken the second treatment.

During the early months of the work in Ceylon, oil of chenopodium was administered in maximum doses of eight minims, repeated in two hours. Castor oil was the only purgative used at this time. Subsequently, the dose was increased to ten and then to twelve minims, until, upon the recommendation of the Malaya Board and of Colonel W. Perrin Norris, Associate Director for the East, it was increased to a maximum of sixteen minims, repeated hourly for three doses. Towards the end of the year, magnesium sulphate was used almost to the exclusion of castor oil as a purgative. With the 8 minim doses, it was rare that more than 20 to 30 per cent of cures were secured after two treatments. As the size of the dose was increased better results were obtained, until,

among one group of patients, there were 65.7 per cent of cures after two treatments.

At the present time, the dispensers in Ceylon are given the following instructions concerning the administration of chenopodium:

1. Oil of chenopodium may be administered in accordance with the following table:

<u>Age</u>	<u>Dose of Chenopodium</u>
1 to 2 years.....	3 minims hourly for three doses
3 to 5 years.....	4 to 5 minims hourly for three doses
6 to 10 years.....	6 to 9 minims hourly for three doses
11 to 16 years.....	10 to 13 minims hourly for three doses
17 to 50 years.....	14 to 16 minims hourly for three doses
Above 50.....	12 to 14 minims hourly for three doses

In any instance where it is impossible or impracticable to give three doses for a treatment, the maximum dose may be divided into two equal parts, and the second portion be administered at an interval of one or two hours after the first.

2. The drug may be administered on sugar, in milk, or in gelatin capsules or globules.

3. On the evening before the treatment is to be given, a dose of Epsom salts is administered in accordance with the following table:

<u>Age</u>	<u>Dose of Epsom salts solution</u>
1 to 5 years.....	4 drams of the solution
6 to 10 years.....	8 drams of the solution
11 to 15 years.....	12 drams of the solution
16 to 20 years.....	16 drams of the solution
21 and above.....	24 drams of the solution

Five pounds of Epsom salts dissolved in five gallons of hot water makes the above solution.

In case this solution is objectionable to certain persons, castor oil may be given as the purgative, in which case give as follows:

<u>Age</u>	<u>Dose of castor oil</u>
1 to 3 years.....	2 drams
4 to 8 years.....	3 to 5 drams
9 to 16 years.....	6 to 10 drams
Above 16 years.....	8 to 16 drams

One and one half ounces is usually the maximum dose that should be given to a female.

4. At, say, 6 o'clock the following morning give the first dose of chenopodium and repeat this dose at 7 and 8 o'clock; at 10 o'clock give a purgative similar in size to, or, if the bowels moved thoroughly, smaller than, the one given on the previous evening.

5. Only a light meal should be eaten the evening before treatment, and no food and very little water should be taken on the morning of treatment, until after the bowels have moved well following the second purgative.

6. No alcohol in any form, or acids, should be taken for a period of twelve hours before and after taking oil of chenopodium, as these substances assist in the absorption of the drug into the system, and this is very undesirable. Symptoms of poisoning may follow if this precaution is disregarded.

7. Dispensers on estates should keep their cases under direct observation until after the last dose of the purgative has been given and has acted. Dispensers in the villages should arrange to be notified in case any of their cases become ill after treatment, or if the purgative does not move the bowels thoroughly, in which case it should be repeated.

8. No treatment should be given until a medical officer has examined the person. The dispenser must not treat persons who have developed the following conditions after previous treatment, until after re-examination by a medical officer:

(a) Very old or emaciated persons, who are made weak by, or after, treatment;

(b) Persons suffering from acute diseases, such as malaria, dysentery, rheumatism, etc.;

(c) Children under two years of age, who become ill after treatment;

(d) Pregnant women, who should not be treated in any instance.

9. No re-examination of the excrement should be made until one week has elapsed after the second treatment; such examination should be made one week after each succeeding treatment. Treatments should be repeated every ten days until the case is cured.

In case only two doses are given for a treatment, it may be repeated at the end of eight days. The excrement should not be re-examined in less than one week after treatment, for the reason that the drug causes the female worm to stop laying eggs for a number of days, and if examination is made in less than one week, the specimen may be negative when in reality the worms have not all been expelled.

In connection with the use of thymol as a specific for hookworm disease, experiments conducted in Trinidad seem to indicate that when this drug is mixed with equal parts of sodium bicarbonate it produces cures more promptly and with fewer disagreeable symptoms than when mixed with equal parts of sugar of milk. The first mixture has also the advantage of being more economical.

For conducting the experiments two districts were chosen, in the first of which sugar of milk and thymol were used; in the second, sodium bicarbonate and thymol. In the first district, of the total number of persons cured, 43 per cent had been cured at the end of two treatments and 76 per cent at the end of four treatments, as compared with 51 per cent at the end of two treatments and 83 per cent at the end of four treatments in the second district. This shows a greater effectiveness on the part of the sodium bicarbonate mixture of 8 per cent at the end of two treatments, and of 7 per cent at the end of four treatments.

The conditions of the test were strongly favorable to the thymol-sugar of milk combina-

tion. In the district in which this mixture was used, the percentage of infection was lower, being 82.5 as compared with 95.2 in the district where the thymol-sodium bicarbonate mixture was used. It has been found that the degree of infection is usually most severe and the individual cases most difficult to cure in districts having the highest percentage of infection, the large proportion of infected persons and the absence of sanitary accommodations in such districts tending to produce a constant source of infection. Again, the population of the second district was composed almost entirely of East Indians, who, because of their insanitary mode of living, always present large numbers of heavily infected cases.

The following statement gives in tabular form a comparison of the results obtained by the two different methods of mixing thymol. In the two columns to the right, the total number of persons cured by each method is shown, followed by the number of persons cured after each treatment.¹ The figures in the two columns to the left represent the percentage of persons cured after each treatment, 100 per cent representing the total number of persons cured in each district. (See Table 5, page 250.)

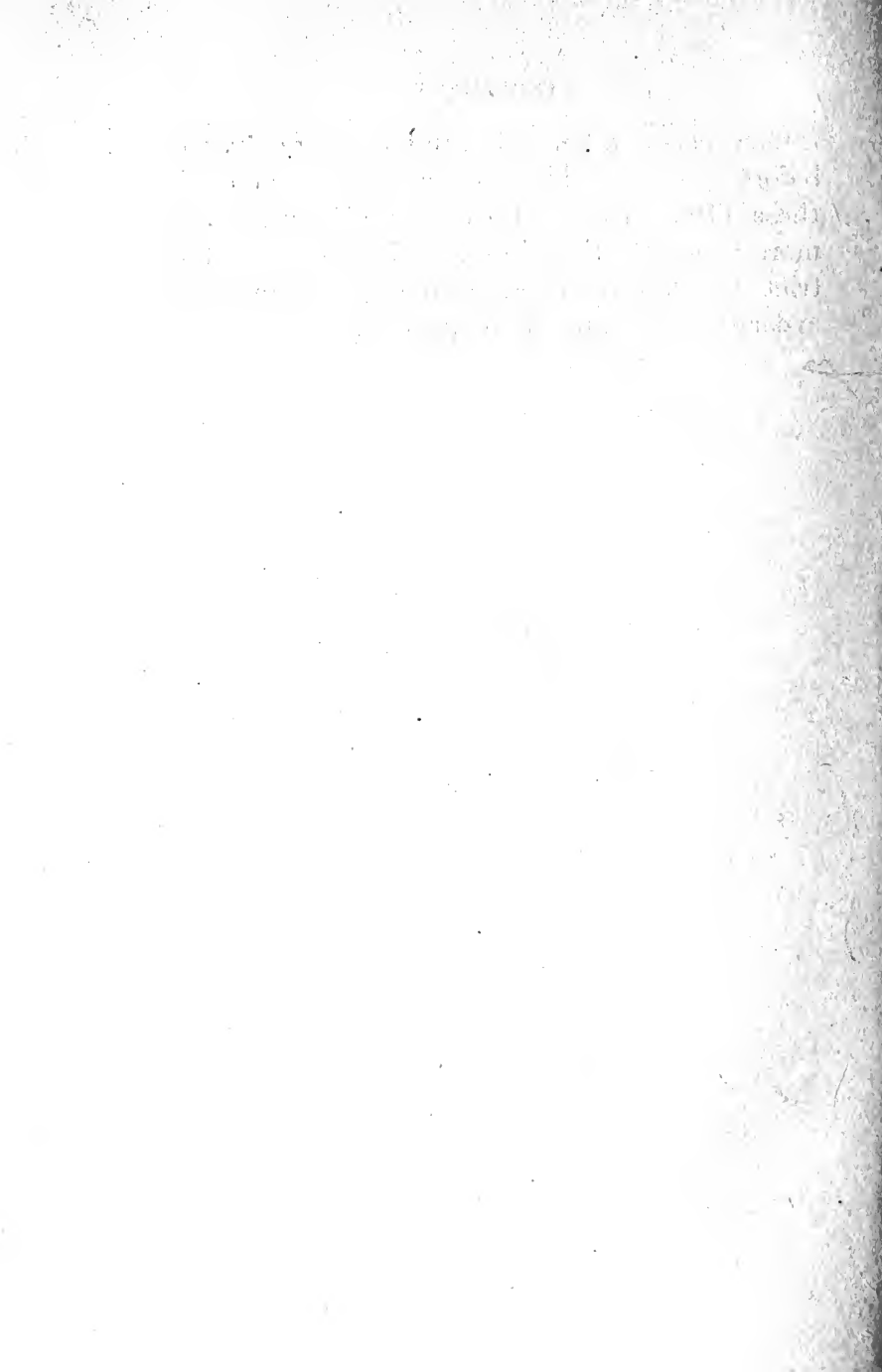
In addition to the patients treated with thymol and sodium bicarbonate in District II,

¹ In Trinidad, microscopic re-examinations for determining cure are made following the first and third treatments.

TABLE 5: *Trinidad: Comparison of Results Obtained with Thymol when Mixed with Sugar of Milk and when Mixed with Sodium Bicarbonate*

	PERCENTAGE OF PERSONS CURED		NUMBER OF PERSONS CURED	
	District I (Thymol and Sugar of Milk)	District II (Thymol and Sodium Bicarbonate)	District I (Thymol and Sugar of Milk)	District II (Thymol and Sodium Bicarbonate)
1. Persons Cured.....	..	..	154	136
2. Persons Cured by:				
1) Two treatments.....	43	51	66	69
2) Four treatments.....	33	32	51	44
3) Five treatments.....	18	8	27	11
4) Six treatments.....	3	4	4	6
5) Seven treatments.....	4	4	6	6
<u>Cumulative Summary</u>				
Percentage of persons cured after two treatments.....			<u>District I</u>	<u>District II</u>
Percentage of persons cured after four treatments.....			43	51
Percentage of persons cured after five treatments.....			76	83
Percentage of persons cured after five treatments.....			94	91

fifteen cases taken at random were treated before work in this district was opened. In these fifteen cases, cures were obtained much more promptly than in either District I or District II, and no disagreeable symptoms were experienced by any of the patients.



IV. ILLUSTRATIONS.

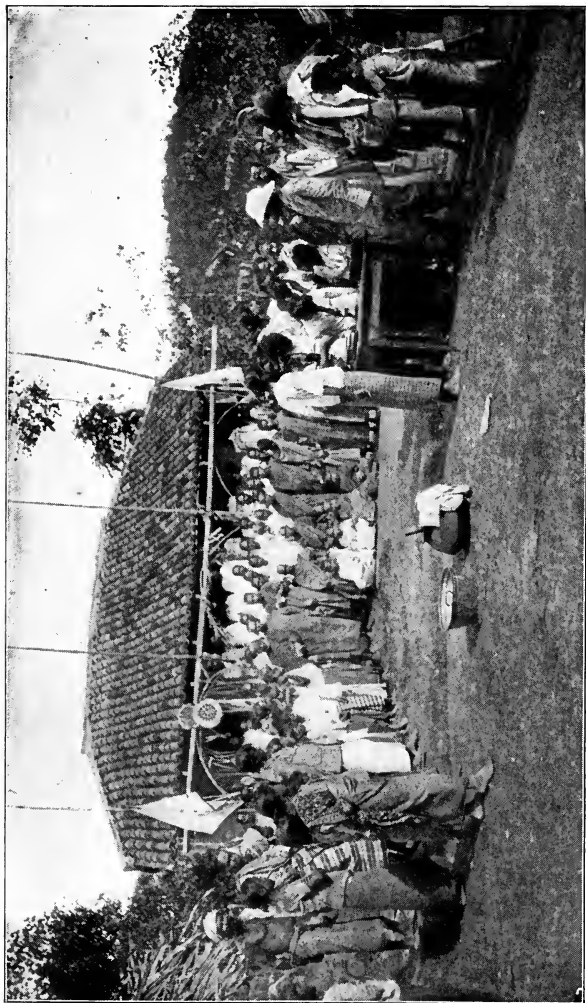


Fig. 1. Group assembled for microscopic demonstration on day of religious festival. Nine Buddhist priests, in robes, are seen in the center. The dispenser, wearing a white helmet, stands to the right. Ceylon

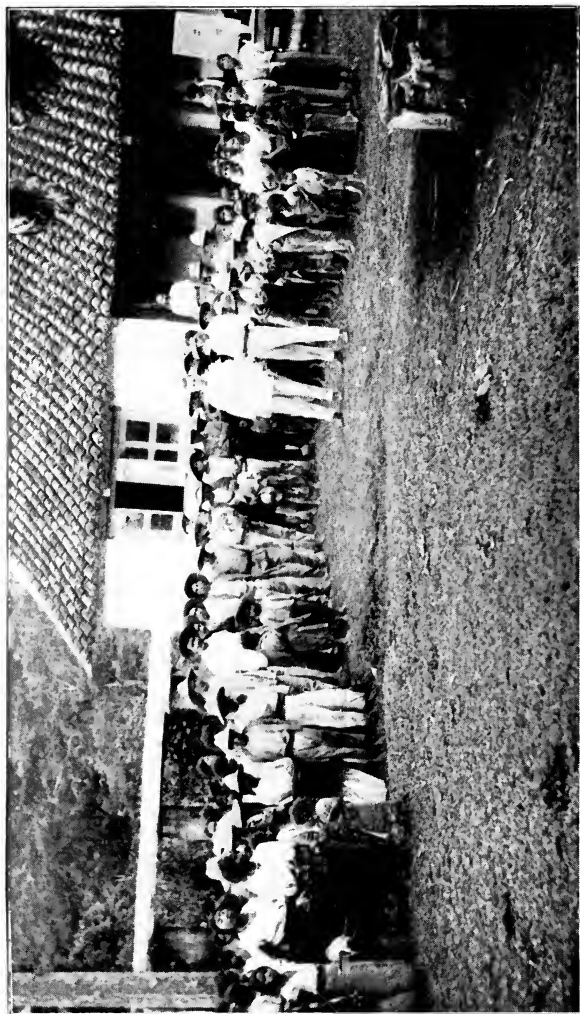


Fig. 2. Dispensary group awaiting treatment. Coffee plantation. Guatemala



Fig. 3. Family of ten, all infected; hemoglobin 50 to 70 per cent; all cured. Guatemala



Fig. 4. Headmaster of village school and family; all infected, all cured. Two of the smaller girls were suffering from chronic leg ulcers. Ceylon

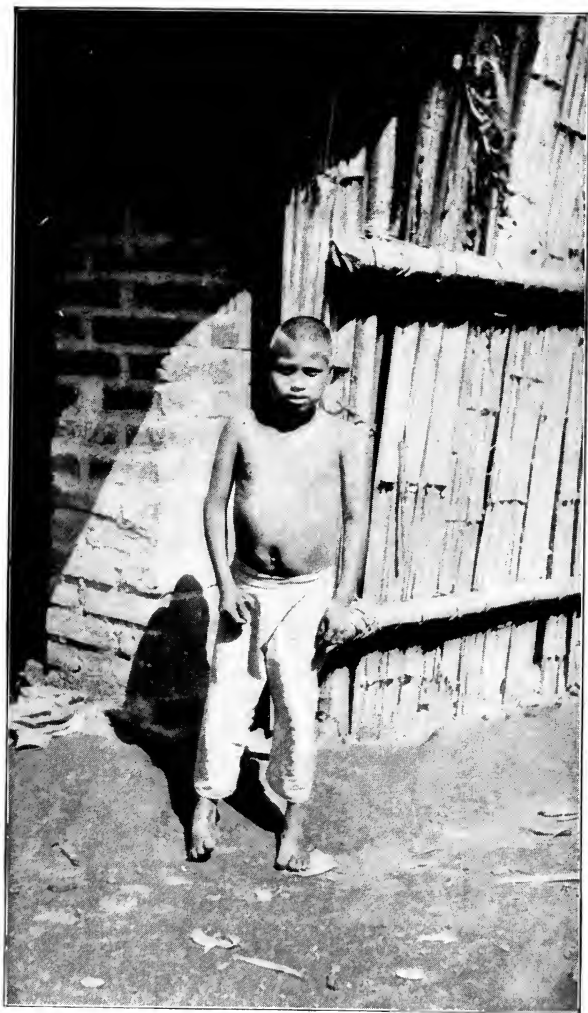


Fig. 5. Severe case of hookworm disease; age, 18 years; weight, 90 pounds; hemoglobin, 40 per cent. Cured. Guatemala



Fig. 6. Child, heavily infected with hookworm disease. Dull, listless facial expression; "pot-belly." Cured. Guatemala



Fig. 7. Patient in last stage of hookworm disease. Fatal termination. Ceylon



Fig. 8. Two boys of the same age; the one on the right has hookworm disease. Guatemala



Fig. 9. Negro, aged 48, infected with hookworm disease. Had been unable to work for eighteen months. Trinidad



Fig. 10. Same patient four months later, after being cured.

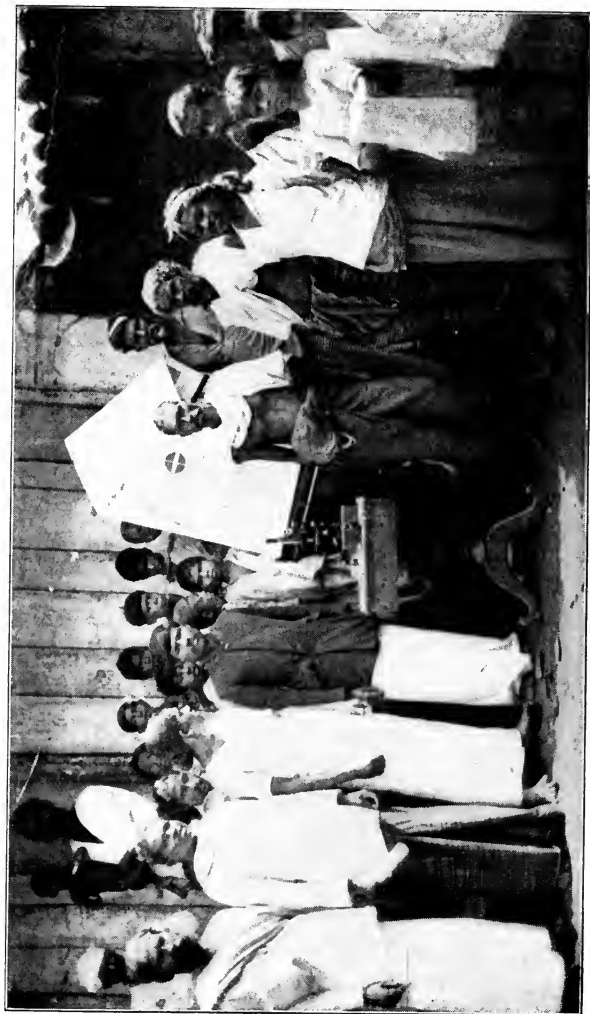


Fig. 11. Lecture and microscopic demonstration at Alawatugoda village. Ceylon

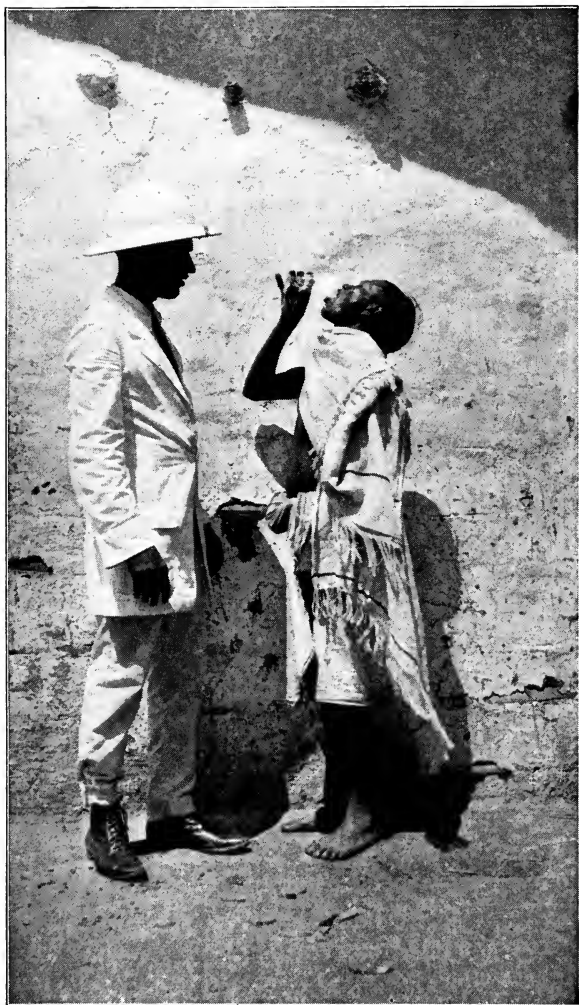


Fig. 12. Dispenser administering preliminary dose of castor oil.
Ceylon



Fig. 13. Dispenser administering dose of oil of chenopodium on sugar. Ceylon



Fig. 14. Three dispensers (standing, extreme left) and their patients. Plantation, Dutch Guiana

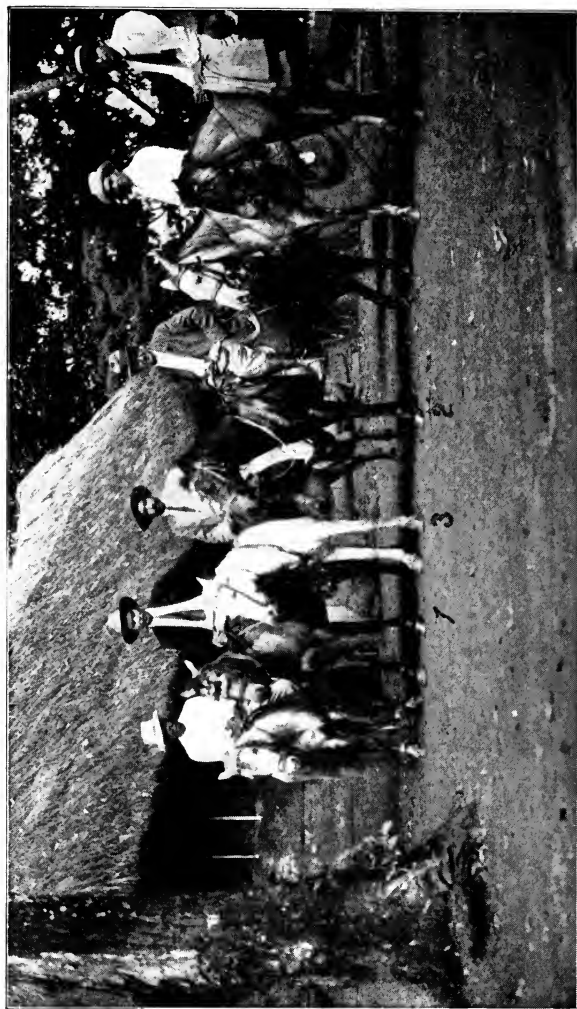


Fig. 15. Portion of staff in Nicaragua on inspection trip, with (1) Dr. D. M. Molloy, Director;
 (2) Dr. M. E. Connor, Acting Director, December 1, 1916, to April 21, 1917; and
 (3) Dr. José Dolores Tijerino, Medical Assistant

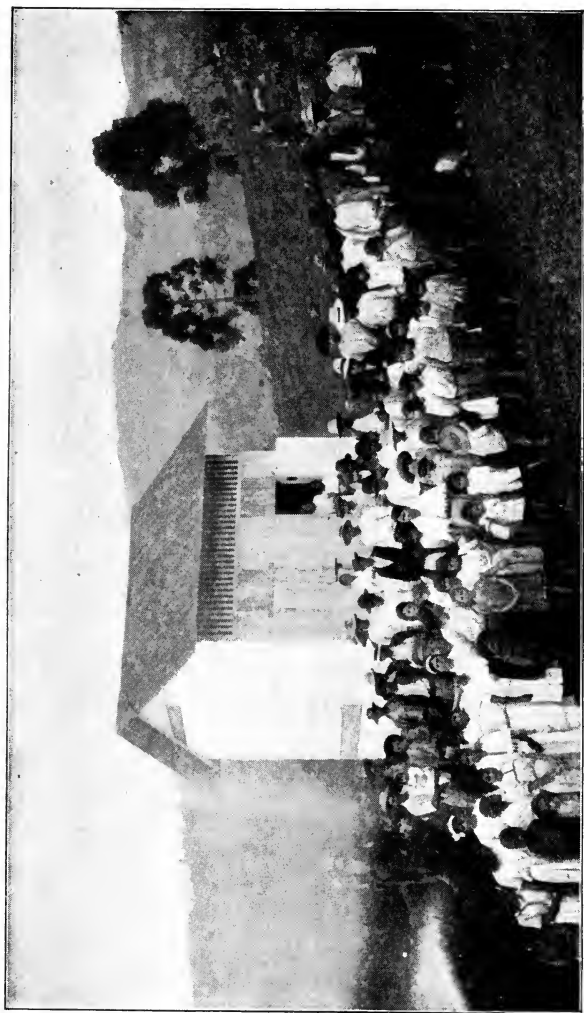


Fig. 16. Patients assembled for treatment. Coffee estate, Costa Rica



Fig. 17. Staff for the relief and control of hookworm disease in Salvador. Dr. C. A. Bailey, the Director, seated in the centre

V. FINANCIAL STATEMENT

V. FINANCIAL STATEMENT

The statement on the following pages shows that in the work of the International Health Board during 1916, a total of \$503,349.74 was expended. This statement is based on expenditures actually made during the calendar year 1916, regardless of when financial reports were received at the New York office. It will be seen that the figures differ from those given in the Treasurer's statement, pages 358 to 359. The Treasurer's report includes amounts paid in the field during the first three quarters of 1916, to which in many instances have been added amounts paid during the fourth quarter of 1915 but not recorded until early in 1916. This discrepancy between the two reports is caused by the necessity of closing the Treasurer's books shortly after the first of the calendar year, before detailed financial reports can be received from the foreign countries in which a large part of the work of the International Health Board is conducted.

Statement of Expenditures by the International Health Board for the Year 1916

FIELDS OF ACTIVITY	Amount Expended
Grand Total.....	\$503,349.74
RELIEF AND CONTROL OF HOOKWORM DISEASE . . .	287,210.68
EXPERIMENTS IN MALARIA CONTROL.....	54,496.97
YELLOW FEVER COMMISSION.....	41,863.17
MEDICAL COMMISSION TO BRAZIL.....	18,513.47
UNCINARIASIS COMMISSION TO ORIENT.....	16,625.62 ¹
INVESTIGATION OF SEWAGE DISPOSAL AT RURAL HOMES.....	664.39
ADMINISTRATION.....	79,287.99
FIELD STAFF SALARIES AND EXPENSES NOT PRO-RATED TO SPECIFIC BUDGETS.....	4,687.45
RELIEF AND CONTROL OF HOOKWORM DISEASE:	
Southern States.....	47,565.09
West Indies.....	88,845.12
Central America.....	88,166.29
South America.....	4,779.77
The East.....	57,854.41
Southern States:	
Kentucky.....	4,866.63
Louisiana.....	1,813.19
Mississippi.....	8,786.77
North Carolina.....	3,282.34 ²
South Carolina.....	5,643.52
Tennessee.....	5,797.57
Texas.....	9,971.36
Virginia.....	7,408.71
West Indies:	
Administration.....	9,271.18
Antigua.....	9,316.68
Barbados (Survey).....	1,651.31 ³
British Guiana.....	18,554.45
Dutch Guiana.....	11,672.46
Grenada.....	10,154.65
St. Lucia.....	6,295.20
St. Vincent.....	6,825.15
Trinidad.....	15,104.04
Central America:	
British Honduras (Survey).....	4,273.47 ⁴
Costa Rica.....	18,089.98
Guatemala.....	11,954.29
Nicaragua.....	18,473.69
Panama.....	24,449.62
Salvador.....	10,925.24 ⁵

Statement of Expenditures by the International Health Board for the Year 1916—*Continued*

FIELDS OF ACTIVITY	Amount Expended
RELIEF AND CONTROL OF HOOKWORM DISEASE — <i>Continued</i>	
South America:	
Brazil.....	\$4,779.77 ⁶
The East:	
Administration.....	22,473.73
Ceylon.....	21,585.84
Fiji Islands.....	3,386.37 ⁷
Java.....	327.66 ⁸
Seychelles Islands.....	3,933.29 ⁹
Siam.....	6,147.52 ¹⁰
EXPERIMENTS IN MALARIA CONTROL:	
Arkansas.....	11,104.58
Mississippi.....	43,392.39
ADMINISTRATION:	
Home Office.....	60,916.37
Survey and Education.....	17,633.62
Panama-Pacific Exposition.....	738.00

¹ No report received from the Uncinariasis Commission for the quarter ending December 31, 1916.

² Work began August 5, 1916.

³ September 4 to November 16, 1916.

⁴ February 7 to May 24, 1916.

⁵ Work began March 6, 1916.

⁶ Work began October 1, 1916.

⁷ Inaugural expenses; actual work began February 13, 1917.

⁸ August 6 to December 11, 1916.

⁹ Inaugural expenses; actual work began February 8, 1917.

¹⁰ Inaugural expenses; actual work began February 7, 1917.

ADDENDA

ADDENDA

In interpreting the statistics included in the reports for the separate countries (see Chapter II), the following explanations may be helpful:

1. For Guatemala, Nicaragua, Panama, and Salvador the figures represent the total results accomplished up to December 31, 1916, in both completed and uncompleted areas.

2. For the countries except Guatemala, Nicaragua, Panama, and Salvador, the figures relate only to the results accomplished in areas in which the work had been completed by December 31, 1916. This should be borne in mind when the results of one year with another are compared.

3. The figures given in this report under the heading of "Prior to 1916" do not always agree with the figures published in the second annual report under the heading "Up to December 31, 1915." This is due in part to a change in the method of reporting which went into effect during 1916, and in part to a revision of figures which was undertaken in certain countries.

4. In interpreting the figures relating to the number of persons found infected, the technique of examination is an important consideration. In the various states and countries, different techniques, all directed to the same end, are in use, but all are not equally accurate or reliable. The following summary offers, in succinct form,

a comparison of the methods used in examining specimens. It indicates whether or not the centrifuge is used, and the maximum number of slides for the microscope which are prepared from each specimen:

<u>COUNTRIES¹</u>	<u>TOTAL</u>	<u>SLIDES EXAMINED</u>	
		<u>BEFORE CENTRI- FUGING</u>	<u>AFTER CENTRI- FUGING</u>
West Indies:			
Antigua.....	5	2	3
British Guiana.....	14	7	7
Grenada ²	4	2	2
St. Lucia.....	5	2	3
St. Vincent.....	4	1	3
Trinidad.....	4	2	2
Central America:			
Costa Rica ³	3 ⁴	..	..
Guatemala ³	3	..	..
Nicaragua ⁵	3	..	..
Salvador.....	5	2	3
The East:			
Ceylon.....	5	2	3

5. The number of persons cured is based upon the number previously infected in whose feces no ova could be detected on re-examination following the last treatment. In considering these figures it should be borne in mind that in practically all dispensary work, and to a more limited extent in the intensive work in the Southern States, re-examinations for determining

¹ The countries omitted from this summary have not reported the methods being used in examining specimens.

² In Grenada this technique has been used only since August 26, 1916.

³ The centrifuge is not used.

⁴ If the patient appears to be clinically infected, and all three slides are negative, another specimen is taken.

⁵ In Nicaragua the use of the centrifuge was begun in the central office during the third quarter of the year, and it is proposed to use this method of examination exclusively in the work to be conducted during 1917. When the centrifuge is used, four specimens are examined, two before and two after centrifuging.

whether cures have been effected are lacking. In work by these methods, all persons reported as "Given First Treatment" receive one or more treatments, and as a result a large majority of them are doubtless much benefited in health if not actually cured; there may be some, however, who accept the medicine but either do not take it or take it contrary to instructions. It is manifestly impossible to correct this error in the records. In work conducted by the intensive method, the patients actually swallow the medicine in the presence of the nurses.

6. In interpreting the figures relating to cures, allowance should be made for the possibility of error in examining specimens. In some cases a patient may remain infected, but a careful search may fail to reveal ova in his stool. The number of such cases will depend upon the thoroughness of the microscopic technique, but in any event will be relatively small and will consist mainly of persons who are lightly infected. For this and for another reason—that a certain proportion of the persons who for various reasons were not examined were doubtless infected—the actual number of persons remaining in the areas uncured at the close of work will probably be greater in every instance than the tables show.

7. In figuring the percentage of persons remaining in the areas uncured at the close of work, the original number of infected persons

and not the total population of the areas has been taken as the base. If the figures for the total population were used as the basis of calculation, the percentage of persons remaining uncured would be considerably lower, but in order to arrive at such a percentage figure it would be necessary to take into consideration a number of estimated factors.

8. In the tables exhibiting the detailed results of work by the intensive method, the terms "Not Treated for Medical Reasons" and "Not Cured for Medical Reasons" relate to very old or emaciated persons, pregnant women, or sufferers from acute heart or kidney disease, typhoid fever, malaria, dysentery, and diarrhea. To administer treatment for hookworm disease to these persons might cause serious complications and possibly death. Consequently the treatment is spoken of as withheld for medical reasons.

9. Persons who have taken one or more treatments for hookworm disease, but have abandoned treatment before being cured, are classed as "Refused." These persons may be divided into two groups: those who refuse to accept even the first treatment, and those who accept one or more treatments but do not continue treatment until cured. Persons who die within the areas of operation while the work is in progress are included in the table as "Removed" from the areas.

CHINA MEDICAL BOARD
Report of the Director

CHINA MEDICAL BOARD

Report of the Director

To the President of the Rockefeller Foundation:

Sir:

I have the honor to submit herewith my report as Director of the China Medical Board for the year 1916.

Respectfully yours,

WALLACE BUTTRICK,

Director.

CHINA MEDICAL BOARD

OFFICERS

Chairman

JOHN DAVISON ROCKEFELLER, JR.

Vice-Chairman

FREDERICK TAYLOR GATES

Director

WALLACE BUTTRICK

Resident Director in China

ROGER SHERMAN GREENE

Secretary

EBEN CHARLES SAGE

Executive Committee

Wallace Buttrick

Frederick Taylor Gates

John Davison Rockefeller, Jr.

Starr Jocelyn Murphy

Francis Weld Peabody

Members ¹

To serve until the annual meeting of 1919

Harry Pratt Judson

Frederick Taylor Gates

Roger Sherman Greene

Francis Weld Peabody

Starr Jocelyn Murphy

To serve until the annual meeting of 1918

John R. Mott

Wallace Buttrick

Simon Flexner

Frank Johnson Goodnow

Frederick Lamont Gates

To serve until the annual meeting of 1917

William Henry Welch

Wickliffe Rose

John Davison Rockefeller, Jr.

¹On January 24, 1917, George Edgar Vincent was elected a member to serve until the annual meeting of 1920.

TRUSTEES OF THE PEKING UNION MEDICAL COLLEGE

OFFICERS

Chairman

JOHN R. MOTT

Vice-Chairman

JAMES LEVI BARTON

Secretary

WALLACE BUTTRICK

Executive Committee

Frederick Taylor Gates, *Chairman*

Arthur Judson Brown
Wallace Buttrick

Simon Flexner
Frank Mason North

Members

To serve until the annual meeting of 1919

Wickliffe Rose
William Henry Welch

Francis Henry Hawkins
Frank Mason North

To serve until the annual meeting of 1918

Simon Flexner
John R. Mott

John Davison Rockefeller, Jr.
James Auriol Armitage

James Levi Barton

To serve until the annual meeting of 1917

Wallace Buttrick
Frederick Taylor Gates

Arthur Wenham
Arthur Judson Brown

These members have been elected as follows:

By the Rockefeller Foundation

Wallace Buttrick
Simon Flexner
Frederick Taylor Gates

John R. Mott
John Davison Rockefeller, Jr.
Wickliffe Rose

William Henry Welch

By the London Missionary Society

Francis Henry Hawkins

By the Society for the Propagation of the Gospel in Foreign Parts

James Auriol Armitage

By the Medical Missionary Association of London

Arthur Wenham

By the Board of Foreign Missions of the Presbyterian Church in the United States of America

Arthur Judson Brown

By the American Board of Commissioners for Foreign Missions

James Levi Barton

By the Board of Foreign Missions of the Methodist Episcopal Church

Frank Mason North



STATEMENT OF THE PURPOSES AND PLANS OF THE CHINA MEDICAL BOARD

In creating the China Medical Board, it was the aim of the Rockefeller Foundation to promote the gradual and orderly development of a comprehensive and efficient system of medicine in China. For a long time the Foundation had been considering the need of scientific medicine in China, and in 1914 a Commission was sent out, consisting of Harry Pratt Judson, President of the University of Chicago; Francis W. Peabody, M.D., of the Harvard Medical School, Boston; and Roger S. Greene, at that time Consul General of the United States at Hankow, now Resident Director in China of the China Medical Board. This Commission visited the several medical schools in China and a large number of hospitals, missionary and other, and upon its return to the United States made a detailed report to the Foundation.¹ This report contained a series of recommendations which were adopted by the Foundation as a working basis, subject to such changes as experience and further knowledge might invite. In addition to this, the Foundation had at its disposal valuable material collected by the Oriental Educational Commission, composed of Dr. Ernest D. Burton

¹ This has been published under the title "Medicine in China," and will be sent to any address on application.

and Dr. Thomas C. Chamberlin, who were sent out by the University of Chicago in 1909 to study general educational conditions in the East. Late in 1914 the Rockefeller Foundation created the China Medical Board, which held its first meeting on December 11, 1914, to effect an organization. A report covering the activities of the China Medical Board for the year ended December 31, 1915, has been published and will be sent on request to any address.

Realizing the importance and value of the work the medical missionaries are doing for the people of China, the China Medical Board has endeavored to co-operate sympathetically with the several missionary societies in strengthening their medical schools and hospitals. To this end the Board has made grants in aid for equipment and other facilities in a limited number of hospitals and at two medical schools, and has also made grants in aid for the support of foreign trained physicians and nurses on their staffs.

A number of fellowships have been granted to doctors and nurses, both foreign and Chinese, for graduate study in this country.

The main work of the Board, however, will be the founding of two medical schools, one at Peking and another at Shanghai, which shall be of the same grade and character as the better medical schools of the United States and Europe.

During the year 1916 five meetings of the China Medical Board have been held as follows:

January 28, April 6, May 26, October 24, and December 22. The Executive Committee has held thirteen meetings as follows: January 21, February 29, March 7, March 27, April 25, June 12, June 16, June 29, July 10, September 29, October 5, November 20, and December 26.

On January 26, the Rockefeller Foundation elected Dr. Frederick L. Gates and Mr. Roger S. Greene members of the China Medical Board, the former to serve until the annual meeting of 1918, and the latter until the annual meeting of 1919.

For convenience the work of the China Medical Board may be classified as follows: I. Medical Education; II. Aid to Missionary Hospitals; III. Fellowships and Scholarships.

I. MEDICAL EDUCATION

1. THE PEKING UNION MEDICAL COLLEGE

A. ACTIONS TAKEN BY THE TRUSTEES OF THE PEKING UNION MEDICAL COLLEGE

First Meeting

The first meeting of the Trustees of the Peking Union Medical College was held on January 24, 1916, when the following officers were elected: Chairman, John R. Mott; Vice-Chairman, James L. Barton; Secretary, Wallace Buttrick; Executive Committee: Frederick T. Gates, Chairman, Arthur J. Brown, Wallace Buttrick, Simon Flexner, Frank Mason North. None of the English trustees were present; they were represented, however, by Dr. Thomas Cochrane, President Emeritus of the Union Medical College of Peking, who held proxies for Mr. Hawkins and Mr. Wenham, and by Dr. William H. Jefferys of Philadelphia and formerly connected with St. Luke's Hospital, Shanghai, who held the proxy of Dr. Armitage.

Present Students of the Union Medical College

At this meeting Dr. Welch, of the Commission sent to China in 1915, read from the report and recommendations of the Commission the section relating to the Union Medical College. After discussion, the Trustees decided that no new students should be admitted to the institution in the fall of 1916, and that the students of

the first, second and preparatory classes should be transferred to the Union Medical College at Tsinanfu, Shantung Province, for the completion of their medical training, provided the Chinese government would confirm the diplomas of students so educated upon examination by the members of the Peking faculty. Later the Chinese government consented to this arrangement and the plan has been carried out to the satisfaction of all the parties interested. The two upper classes are completing their clinical work at Peking.

Committee of Control

Pending the opening of the reorganized college, a Committee of Control was appointed to administer the local affairs of the college, consisting of Mr. Roger S. Greene, Resident Director in China of the China Medical Board, Dr. Charles W. Young, Dean of the College, and Dr. Edward J. Stuckey, a member of the faculty.

Language

At this same meeting, the English language was determined upon as the medium of instruction, and it was decided that while a knowledge of the Chinese language would undoubtedly be valuable, it will not be required of all members of the faculty. These actions were in accordance with the recommendation of the China Medical Commission, which may be found on page 91 of "Medicine in China."¹

¹ See also pp. 81-85 of "Medicine in China" for discussion.

Organization

At the first annual meeting of the Trustees of the Peking Union Medical College held on May 23, 1916, organization was effected under a provisional charter granted by the Regents of the University of the State of New York, by-laws were adopted, and the lease of the property from the China Medical Board was accepted as contemplated in the memorandum of agreement with the London Missionary Society made in 1915. At this meeting it was our pleasure to welcome Mr. F. H. Hawkins, Secretary of the London Missionary Society, who represents that Society as trustee, and Dr. R. Fletcher Moorshead of the Baptist Missionary Society (England), who held the proxy of Mr. Arthur Wenham of the London Medical Missionary Association. The officers chosen at the meeting of January 24, enumerated in the first paragraph of this section, were unanimously re-elected. It was decided to hold the annual meeting of the Trustees on the second Wednesday of April in each year.

Appointment of Executive Head

On June 20, 1916, the Executive Committee of the Peking Trustees elected Franklin C. McLean, Ph.D., M.D., of the Rockefeller Institute Hospital, Professor of Medicine and Physician-in-Chief. Dr. McLean visited China and made a careful study of the situation there, returning in October, when he submitted a report of his findings and recommendations.

Premedical School

At the meeting of the Executive Committee held December 20, it was decided to open a Premedical School at Peking in September, 1917. Students in preparatory schools and colleges in China at the present time are not receiving sufficient instruction in science to enable them to undertake work in a high grade medical school. The Board, therefore, faced the dilemma of either aiding a number of colleges to strengthen their scientific departments, or of creating a school of its own. After careful consideration, the conclusion was reached that for the present it will be necessary to conduct a premedical school in connection with the Peking Union Medical College. This, however, is considered a temporary arrangement, and it is hoped that within a few years the colleges of North China will be able so to advance their courses in science as to prepare students for the medical school.

Meetings

The Board of Trustees has held two meetings, on January 24, and on May 23. The Executive Committee has met twice, on June 20, and on December 20.

**B. ACTIONS OF THE CHINA MEDICAL BOARD AFFECT-
ING THE PEKING UNION MEDICAL COLLEGE**

In furtherance of the action of the Peking Trustees in sending the first, second, and preparatory classes of the Peking College to the Union Medical College at Tsinanfu to complete their education, the China Medical Board on March 7 made two substantial appropriations to the Tsinanfu Union Medical College: for buildings and equipment \$50,000, and for maintenance during a period of five years a total sum of \$100,000, which may be drawn against at any time at their discretion. The object of this gift was to cover the cost to the Tsinanfu Medical College of educating the students sent to them by us, and also of the enlargements of their plant made necessary for the accommodation of these students. The Board also had in mind the wish of the China Medical Missionary Association to establish a high grade medical school to be taught in the Chinese language.

Land Purchases

Through the negotiations of Mr. Greene, the Resident Director, the Board has acquired the palace of Prince Yu, known as the Yu Wang Fu property, a tract of over eight acres located about 300 feet from the present medical school buildings. On this land the laboratories, outpatient department, hospitals, nurses' home, and religious building for the reorganized medical

school will be constructed. Mr. Greene has also purchased some small parcels of land adjacent to the Ying property, and a considerable tract adjoining the present hospital.

Architects

Mr. Charles A. Coolidge, head of the firm of Coolidge & Shattuck, Boston, was engaged as consulting architect. He visited China and made careful study of our architectural problems, returning to this country in October when he made a full report of his conclusions and recommendations.

On December 22 the Executive Committee requested Mr. Harry Hussey, of the firm of Shattuck & Hussey, architects, of Chicago, who has had considerable experience in building in China, to prepare plans and recommendations for buildings at Peking. Mr. Hussey, with the co-operation of Mr. Coolidge, prepared tentative plans for the consideration of the China Medical Board, and was later instructed to make permanent plans.

2. THE SHANGHAI MEDICAL SCHOOL

At its meeting held April 6, 1916, the China Medical Board formally voted to establish a medical school at Shanghai. On April 11, the Rockefeller Foundation approved this action and designated funds in sufficient amount to provide the plant and maintain the school. The following persons have been selected as Trustees

of the Shanghai Medical School of the Rockefeller Foundation:

Fletcher S. Brockman	Starr J. Murphy
Wallace Buttrick	Francis W. Peabody, M.D.
Walter G. Cannon, M.D.	Robert E. Speer
Simon Flexner, M.D.	George E. Vincent
Frederick L. Gates, M.D.	William H. Welch, M.D.
John W. Wood	

No meetings have yet been held.

3. RED CROSS HOSPITAL, SHANGHAI

Until July of 1916 the Harvard Medical School of China conducted its school in the laboratories and hospital owned by the central committee of the Chinese Red Cross Society. When the Harvard Medical School closed its work in July, 1916, the China Medical Board assumed the support of the hospital for a period of two years. This action insures the maintenance for that period of a much needed institution in Shanghai and will also afford a place for work to members of the staff of the Shanghai Medical School who may be sent out before the new buildings have been constructed.

The services of Dr. Henry S. Houghton, formerly Dean of the Harvard Medical School of China, were engaged by the China Medical Board from July 1, 1916. He will have charge of the Red Cross Hospital and will co-operate with Mr. Greene in directing the Board's activities in China. There were some vacancies in the hospital staff, occasioned by the withdrawal of

teachers of the Harvard School, and the Board has sent out on temporary appointment Dr. Roger I. Clapp, an eye, ear, nose and throat specialist, and Dr. William B. Sharp, an internist.

4. HUNAN-YALE MEDICAL SCHOOL, CHANGSHA

The China Medical Commission of 1914 recommended a grant for a laboratory at the Hunan-Yale Medical School in Changsha. An application for such a laboratory was presented to the Board on October 24, and \$30,000 was appropriated, of which \$25,000 is to be used for the building and \$5,000 for equipment.

5. ST. JOHN'S-UNIVERSITY OF PENNSYLVANIA MEDICAL SCHOOL, SHANGHAI

As stated in the Report of the Director for 1915, the St. John's-University of Pennsylvania Medical School, the University of Nanking, and the Harvard Medical School of China have decided to discontinue their medical work because of the China Medical Board's purpose to found a medical school in Shanghai. Pending the establishment of the school of the China Medical Board, however, the St. John's-University of Pennsylvania School continues its work. An appropriation of \$1,500 has been made to the school for the salary of a teacher of anatomy.

II. MISSIONARY HOSPITALS

In aiding missionary hospitals the Board has for its main purpose the desire to co-operate with the missionary societies in strengthening their valuable work. It has also had in mind the needs of future graduates from its medical schools. When these graduates leave the medical school they will need to spend at least one year as internes. It is important, therefore, that there shall be a number of well-developed hospitals where they can serve internships. In making its appropriations the Board, therefore, has sought to select hospitals which are accessible from Peking and Shanghai.

It is also the hope of the China Medical Board that when its two medical schools are well established, it may be possible for missionary doctors to be released from their duties for, say, three months every year, to take graduate work in one or other of the schools. It is obvious that such work in association with other missionary doctors and under the general guidance of members of the faculties, will be of great service to the physicians who are working in missionary hospitals. Such an arrangement would not be practicable for hospitals which have but one doctor on their staffs. Appropriations for the increase of staffs of the hospitals, therefore, serve as steps toward the consummation of this larger plan.

Grants in aid have been made during the year 1916 to the following missionary organizations:

American Baptist Foreign Mission Society (North).

Foreign Mission Board of the Southern Baptist Convention.

American Board of Commissioners for Foreign Missions.

Board of Foreign Missions of the Methodist Episcopal Church (North).

Board of Missions of the Methodist Episcopal Church (South).

Board of Foreign Missions of the Presbyterian Church in the U. S. A. (North).

Executive Committee of Foreign Missions of the Presbyterian Church in the U. S. (South).

Foreign Christian Missionary Society.

London Missionary Society.

Church of Scotland Foreign Mission Committee.

Canton Christian College for the Canton Hospital.

Nanking Hospital (Union).

Huchow Hospital (Union).

Five-Year Terms

On April 6 the Board resolved that as a rule its appropriations for the support of medical missionaries and nurses, including grants already made, should be for periods of five years.

Conditions of Gifts

On May 26 the Board took the following action:

"Resolved, that hereafter appropriations to hospitals in China shall be made only upon the understanding and agreement that societies making application shall contribute at least one fourth of the total sum desired for increase of staff, equipment, or plant."

It was the belief of the Board that this policy would tend to promote larger contributions from churches and individuals and in general stimulate interest in medical missions.

Union Hospitals

In Nanking several missions have united to maintain one general hospital, connected with the University of Nanking. This was the hospital formerly connected with the medical school of the University of Nanking which has been discontinued because of the proposed China Medical Board school soon to be established at Shanghai. Toward the general expenses of the Union Hospital at Nanking the Board has voted to provide for five years the salaries of one physician and three nurses, together with the further sum of \$3,000 a year for maintenance, on condition that the missionary societies and the University shall provide three physicians, one nurse superintendent, and \$3,000 a year for maintenance during the same period. The Board has further contributed \$25,000 toward \$50,000 for buildings and equipment.

At Huchow the Northern Baptists and Southern Methodists have joined to maintain a Union Hospital. They propose to build and equip a new hospital plant at a total cost of \$48,500, toward which sum the China Medical Board has subscribed \$20,000, payable when a further sum of \$28,500 shall be secured by the two societies. The Board has also pledged a sum averaging about \$2,000 a year for five years to cover three fourths of the cost of one additional foreign doctor, one additional foreign nurse and one additional Chinese doctor for this Union Hospital.

To the Canton Christian College a grant of \$4,500 a year for five years has been made, of which \$2,500 is for a business manager in the Canton Hospital and the remaining \$2,000 for the general maintenance of the hospital. This hospital, which is supported by the Chinese in co-operation with several missionary societies, is one of the largest and oldest hospitals in China.

Details

The total amount appropriated to these mission hospitals for expenditure during the year 1916 was \$158,502.20, of which \$78,704.20 was for capital expenditure and \$79,798 for annual maintenance. A further sum of \$271,087 has been pledged for current expenses during the next five years, and \$20,000 will be payable in 1917 on capital account. A detailed list of these appropriations for mission hospitals, giving the location of hospitals, the organization under whose auspices they are conducted, and the amount and specific designation of the appropriations will be found in the Treasurer's Report, pp. 364 to 370.

III. SCHOLARSHIPS AND FELLOWSHIPS

Medical Missionaries on Furlough

Twenty-seven medical missionaries on furlough from China have received appropriations from the China Medical Board during 1916 for graduate study in the United States. Three of these grants have been renewals for a second year of work. These missionary physicians have studied in various institutions in the United States, including the Johns Hopkins Medical School, the Harvard Medical School, the Mayo Clinic in Rochester, Minnesota, Rush Medical College, Chicago, the Massachusetts Eye and Ear Infirmary, Manhattan Eye and Ear Hospital, the New York Post-Graduate Hospital, the New York Polyclinic Hospital, the Skin and Cancer Hospital, New York, the Lakeside Hospital, Cleveland, the Philadelphia Polyclinic, and the New York Presbyterian Hospital. In two instances a doctor and his wife (in one case a nurse and in the other herself a doctor) have both been given fellowships. The total amount appropriated for payment during 1916 for these fellowships was \$26,750. The names of the missionaries who have received such grants follow:

John Todd Anderson, Southern Baptist Mission, Chengchow, Honan.

N. Worth Brown, Nanking Hospital, Nanking, Kiangsu.

A. M. Dunlap, Harvard Medical School of China, Shanghai, Kiangsu.

J. M. Gaston, Southern Baptist Mission, Laichowfu, Shantung.

F. W. Goddard, American Baptist Mission, North, Shaohsing, Chekiang.

N. S. Hopkins, Southern Methodist Mission, Peking, Chihli.

Harvey J. Howard, Canton Hospital, Canton, Kwangtung.

Allen C. Hutcheson, Southern Presbyterian Mission, Kashing, Chekiang (recently transferred to the Nanking Hospital).

Claude M. Lee, American Episcopal Mission, Wusih, Kiangsu.

Charles Lewis, American Presbyterian Mission, North, Paotingfu, Chihli.

Dr. and Mrs. O. T. Logan, American Presbyterian Mission, North, Changteh, Hunan.

W. McClure, Union Medical College, Tsinanfu, Shantung.

Frederick P. Manget, Southern Methodist Mission, Huchow, Chekiang.

J. Preston Maxwell, English Presbyterian Mission, Yungchun, Fukien.

W. R. Morse, American Baptist Mission, Chengtu, Szechuen.

Way Sung New, Harvard Medical School of China, Shanghai, Kiangsu.

B. E. Read, Union Medical College, Peking, Chihli.

J. E. Skinner, American Methodist Mission, North, Yenping, Fukien.

John A. Snell, Southern Methodist Mission, Soochow, Kiangsu.

Mary Stone, American Methodist Mission, North, Kiukiang, Kiangsi.

Adrian S. Taylor, Southern Baptist Mission, Yangchow, Kiangsu.

W. S. Thacker, Society for the Propagation of the Gospel, formerly at the Union Medical College, Peking, Chihli.

J. G. Vaughan, Northern Methodist Mission, Nanchang, Kiangsi.

Volrath Vogt, Norwegian Mission Society, Yiyang, Hunan.

Mrs. Volrath Vogt, Norwegian Mission Society, Yiyang, Hunan.

Among the above named missionaries, seven have completed their studies and returned to China.

Fellowships for Chinese Doctors

In 1914 and 1915 six Chinese doctors were carefully chosen from a large number of applicants and sent to this country for graduate study in medicine. One of these, Dr. Li Tsing-meu, has returned to China and is working at the Peking Union Medical College. The remaining five, Drs. Li Tsing-liang, Hsieh En-tseng, Shen Szejen, Tsen Tsung-hsien and Peter Kiang applied for and were granted fellowships for a second year. Appropriations were also made for the return of all six to China. Two other Chinese physicians, Dr. F. C. Yen of the Hunan-Yale Medical School and Dr. George Y. Char of the Church General Hospital, Wuchang, have also received fellowships during the year.

Chinese Nurses

In 1914 five nurses' scholarships were created. Two nurses were appointed to these scholarships in 1915, Miss Mildred Wu of Changsha and Miss Lillian Wu of Kiukiang, and this year Miss Elizabeth Li Sing Sze of Soochow has been added to their number. The scholarship for Miss Mildred Wu was extended for an additional period of three months.

Chinese Pharmacists

In 1915 the Board appropriated \$3,900 for scholarships for three pharmacists, covering the

cost of travel to America and return to China, together with maintenance for one year. These scholarships were not filled until April of this year, when Messrs. Cheng Tsung-yi of Peking, and How Kyan-tsing and Hsi Yin-dah of Changsha were appointed, and came to America to study at the University of Maryland Medical School in Baltimore. Later in the year the amount of their stipend was slightly increased, because the maintenance allowance was found to be inadequate for their needs.

IV. MISCELLANEOUS

Harvard Medical School of China

In June, 1916, the Harvard Medical School of China closed its work. As already noted, the Board took Dr. Houghton, formerly Dean of the Harvard Medical School of China, upon its permanent staff. Two former members of the Harvard Medical School faculty, Dr. A. M. Dunlap and Dr. W. S. New, have been granted fellowships in this country and are now studying at the Harvard Medical School, Boston.

Pursuant to agreement, the China Medical Board is completing the education of selected students from the Harvard Medical School of China. Six of these students are pursuing their studies at the Harvard Medical School, Boston; one other will arrive later for study here; and six students are pursuing their studies in China. The total cost to the Board for completing their medical education will be not more than \$29,800. The students who are working at the Harvard Medical School in Boston have the benefit of the advice and guidance of Drs. Dunlap and New, who are taking graduate work there.

Translation

On October 24 a grant of \$4,500 for the years 1916-17 and 1917-18 was made to Dr. P. B. Cousland, Secretary of the Publication Committee of the China Medical Missionary Asso-

ciation, for the translation of medical textbooks. Dr. Cousland and his assistant are now at work in Yokohama under this appropriation.

Seven hundred dollars was appropriated as a renewal of the grant to the Nurses' Association of China for the translation of nursing textbooks.

WAR RELIEF COMMISSION
Report of the Chairman

WAR RELIEF COMMISSION

Report of the Chairman

To the President of the Rockefeller Foundation:

Sir:

I have the honor to submit herewith my report as Chairman of the War Relief Commission for the year 1916.

Respectfully yours,

WICKLIFFE ROSE,
Chairman.

WAR RELIEF COMMISSION

The War Relief Commission of the Rockefeller Foundation was established, it will be remembered, in the latter part of the year 1914. The purpose underlying the establishment of this Commission was to secure authoritative reports of the actual conditions in areas where relief measures were required and recommendations as to work to be undertaken based upon first-hand knowledge of the problems to be met.

The difficulties experienced by the Foundation during 1915 in making its relief plans effective and in keeping closely in touch with conditions in Europe, made it evident that in order to achieve satisfactory results in war relief activities the War Relief Commission should be placed on a more permanent footing in Europe. Accordingly, the Director of the War Relief Commission, Mr. Warwick Greene, accompanied by Mr. William J. Donovan of Buffalo and Mr. Reginald C. Foster of Boston, sailed for Europe in March, and shortly thereafter established the headquarters of the Commission at Berne, Switzerland.

The War Relief Commission consists of Wickliffe Rose, Chairman, Warwick Greene, Director, and the following members: Ernest P. Bicknell; Dr. Hermann M. Biggs; Dwight F. Davis; Dr. Alphonse R. Dochez; William J. Donovan; Charles H. W. Foster; Reginald C.

Foster; Henry James; Wallace C. Sabine; Jeremiah Smith, Jr.; Edward R. Stoever; Eliot Wadsworth, and Frederic C. Walcott.

An account of the war relief projects initiated by the Commission during 1916, and also of those to which the Foundation contributed directly is given in the following pages.¹

RELIEF OF BELGIAN CHILDREN

The Rockefeller Foundation received, early in July, from Mr. Warwick Greene, an appeal to the American public for the relief of about five hundred children who were at that time living in the fighting zone in that part of Belgium which had not been occupied by the German forces.

Arrangements had already been made, and money subscribed from Swiss sources, for the removal of seven hundred and sixty children who had been similarly situated to the canton of Fribourg in Switzerland, where provision was made for their protection, maintenance, and education under the direction of Baroness de Montenach, President, and Mlle. Clément, Vice-President of the International Young Girls' Protection Society.

From a careful investigation of this work it had appeared to be carried on in an efficient, economical and sympathetic manner. When the needs of five hundred additional children

¹ A statement of expenditures made by the Rockefeller Foundation from the beginning of the European war to December 31, 1916, will be found in Appendix VI, pp. 428-431.

were brought to the attention of those in Switzerland who had been interested in the matter, it became apparent that their already over-taxed resources were unequal to this new demand. The Queen of the Belgians then asked that an appeal be transmitted to America.

Upon the receipt of this appeal the Rockefeller Foundation took the matter up with the Belgian Relief Fund of New York and the New England Belgian Relief Fund of Boston, and received immediate assurances of co-operation. The cost of taking care of the additional five hundred children in the manner suggested had been estimated at \$73,000 for the first year, or a cost of forty cents per capita per day. In case the prolongation of the war should necessitate continued provision for these children, the cost for the second year was expected to be \$51,000, or twenty-eight cents per capita per day.

In order that the removal of the children might not be unnecessarily delayed, the Rockefeller Foundation instructed the Director of the War Relief Commission to authorize their removal from Belgium and guaranteed the cost of carrying out the plan for their maintenance in Switzerland. Toward the necessary cost for the first year the Belgian Relief Fund of New York City appropriated \$25,000; the New England Belgian Relief Committee appropriated \$10,000, and the Refugees Relief Fund appropriated \$3,000.

Acting under this authority from the Foundation, the Director of the War Relief Commission entered into an agreement with the Comité Central Suisse de Secours aux Réfugiés Belges, whose activities included the transportation of Belgian children to Switzerland. The arrangement was consummated in detail with the subcommittee at Fribourg. Following the completion of the arrangements between the War Relief Commission and the Comité Suisse de Secours, the ladies of the committee busied themselves with preparations for the coming of the children. Baroness de Montenach and Mlle. Clément found four buildings suitable to the reception of the children—three at Fribourg and one at Vaulruz near Brulle, about thirty miles from Fribourg. The building at Vaulruz is the historic Château de Vaulruz, which now belongs to the state. The state has made no charge for the use of the building. The buildings were rapidly adapted to their new purpose. Furniture was purchased and clothing prepared. The sharp advance in the prices of food and other supplies made it very difficult to keep within the estimated expense. The committee was greatly aided to this end by some fifty women of Fribourg and Vaulruz, who worked voluntarily for two months sewing the wearing apparel and bed clothing for the children.

The first contingent of Belgian children to be hospitalized in Switzerland under the grant of

the Rockefeller Foundation arrived on September 20. There were 75 children in all—32 girls, 43 boys. They were first taken to Lausanne, where many of the women met them at the railroad station to give them affectionate welcome, and to care for them on their way to the hospital where they were clothed with the garments which had been sent down from Fribourg and Vaulruz. The doctors and nurses at the hospital spent the day in examining and vaccinating them. All of this was voluntary service. In the evening they were taken on; the girls to Fribourg and the boys to Vaulruz. The children were most of them from five to six years of age, though one was as young as two years and another, who had been the mother to the whole party and of inestimable value on the journey, was sixteen years of age.

On account of the difficulty of mail communication only fragmentary reports have come to hand concerning the Belgian children brought into Switzerland under the Foundation's guarantee. It is probable that about 200 have been received up to the present time. A member of the Commission saw some of the children in the latter part of November, and also inspected their living quarters. He reports that the clothing provided is amply warm and serviceable, and that the children are comfortably housed and well managed. Photographs are appended of some of the Belgian children, of the building

in which they are housed and of one of the dormitories in the building (pages 335 to 338).

STIPENDS FOR BELGIAN PROFESSORS

The grant made by the Foundation to provide stipends for Belgian professors of scientific subjects who are refugees in England was continued throughout 1916, \$15,000 being appropriated for that purpose.

POLAND

Throughout the year the War Relief Commission in co-operation with the Commission for Relief in Belgium made every effort to bring about an agreement between the belligerent countries whereby foodstuffs and other supplies might be brought into Poland and distributed to the distressed population by representatives of neutral countries. Mr. Frederic C. Walcott, a member of the firm of William P. Bonbright & Company, in company with Mr. Caspar Whitney of the Commission for Relief in Belgium, visited Poland on behalf of the Rockefeller Foundation. They found conditions of indescribable misery and suffering which had been steadily growing worse since the wholesale devastation of factories, homes and crops in the fall of 1915. Mr. Walcott and Mr. Whitney were able to negotiate a tentative agreement with officials of the German government covering the importation of food and supplies into Poland. Upon returning to England, Mr. Wal-

cott and Mr. Herbert C. Hoover, Chairman of the Commission for Relief in Belgium, took up the matter of the relief of the Polish population with the British government. The Director of the War Relief Commission subsequently took Mr. Walcott's place in the negotiations, Mr. Walcott being obliged to return to the United States.

The Trustees of the Rockefeller Foundation at their meeting of May 24, 1916, seconded the efforts being made to assure relief for Poland by appropriating the sum of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania. It was thought probable that the Balkan countries could be included in any arrangement covering the importation of supplies into territory occupied by the Central Powers, which made it seem desirable to make provision for them in this appropriation.

While Mr. Hoover and Mr. Greene were successful in securing from the British government a statement of the conditions upon which they would allow food and other supplies to be sent into Poland, it ultimately proved to be impossible to reconcile the conflicting stipulations of Great Britain and Germany with respect to this undertaking.

The failure of the general plan of relief for the Polish people did not cause the members of the War Relief Commission to relax their efforts in behalf of that afflicted population. On the contrary, they pushed forward with increased energy

the development of certain special relief enterprises, which while only slightly mitigating the general misery and suffering, nevertheless offered distinct opportunities to save many thousands of lives.

In the latter part of September the Commission was able to purchase one hundred and ten tons of condensed milk in Switzerland and to secure permission to ship it to Poland. Eighty tons of the condensed milk were shipped to Warsaw and thirty tons to Lodz. Mr. Reginald C. Foster, a member of the War Relief Commission, conducted with officials of the Swiss and German governments the negotiations concerning the shipments of milk into Poland and gave the necessary guarantees concerning its proper distribution. By permission of the German government he visited Warsaw and Lodz late in October, and made arrangements with the local officials and representatives of relief societies in each city for controlling the apportionment and distribution of the milk supply.

In Warsaw, Mr. Foster found the relief work well organized. The city, with a population of 900,000, had been divided for the purposes of relief work into twenty-six districts. Each of these districts was a complete unit containing five soup kitchens in which over 120,000 portions of a wholesome vegetable meat soup with a piece of bread was given daily; institutions for the care of children, such as asylums for orphans

and day nurseries where working parents might leave their children during the day, and stations for the distribution of milk to the infants. In each district also was a medical unit which examined and cared for the poor.

Using this method of distribution as a basis, a Rockefeller Warschauer Hilfsausschuss (Rockefeller Warsaw Relief Commission) was formed, combining the heads of the various departments and committees already engaged in relief work in the city. The names of the members of the Commission follow:

Prince Lubomirski, mayor of the city.

Mr. Leon Goldstand, representing Prince Lubomirski.

Mr. Hernando de Soto, American Consul.

Mr. Witold Fuchs, American Vice-Consul.

Mr. Geisler, head of the Children's Relief Committee.

Mr. Hirzel, head of the soup kitchens.

Mr. Przanowski, representative of the Deutscher Lebensmittelsekt.

Mr. S. Natanson, Jewish representative.

Mr. R. C. Foster, Rockefeller War Relief Commission.

With the exception of the American Consul and the representative of the War Relief Commission the members named above are all Poles.

In order to safeguard the distribution of the condensed milk the Rockefeller Warschauer Hilfsausschuss was directed to observe the following instructions:

The milk is intended only for Polish children.

It is to be distributed without regard to religious faith.

It is primarily for children up to three years of age and is intended to supplement whatever quantities of fresh milk the various local committees can obtain.

The quantity shall be distributed equally over the thirty days of the month.

The milk shall be given out only in prepared form, employing day nurseries and other institutions wherever possible so as to assure that only children receive it.

The empty tins shall be checked by the representatives of the Rockefeller Warschauer Hilfsausschuss, which in turn will turn them over to some organization employing the destitute in making various saleable articles from this metal.

Substantially the same arrangements for distributing the milk were made by Mr. Foster at Lodz. The distribution of the milk began about November 15. All told a sufficient quantity of condensed milk was shipped to Warsaw and Lodz to feed approximately 16,000 children daily. It was estimated that the total supply imported would last until the middle of January.

In connection with his visit to Warsaw and Lodz, Mr. Foster found the need for clothing to be very immediate in those cities and learned that a similar condition existed in the other large centers of Poland. Men, women, and children were walking the streets without shoes or stockings and in rags that provided small protection against the cold of the winter. Knowing that from time to time the American Relief Clearing House in Paris received large shipments of new and second-hand clothing, Mr. Foster appealed to that organization for help. At the same time he caused the need for clothing to be brought to the attention of the Polish Relief Committee in London and the Commission for

Relief in Belgium. Learning also of the possibility of purchasing odd lots of clothing, cloth, shoes and stockings in Switzerland, Mr. Foster asked the Foundation to appropriate one hundred thousand dollars to take advantage of such opportunities. The amount requested by Mr. Foster was promptly sent to him by the Foundation.

Mr. Foster was able to purchase in Berlin in the fall some forty-five tons of cocoa, which, although not of the usual nutritive standard, contained sufficient food value to make it of use for the destitute in Poland. The cocoa was distributed in Warsaw and Lodz through the committees already organized for distributing condensed milk.

SERBIA

The invasion of Serbia by the Central Powers in the fall of 1915 created conditions of extreme distress among the civilian population. Hundreds of thousands of the people fled before the invading armies, and it is estimated that fully fifty per cent of these refugees succumbed to exposure, disease and hunger.

Following the conquest of Serbia, the control of her territory was divided between Austria and Bulgaria. Mr. Edward Stuart, of the American Red Cross, who had charge of relief activities in Serbia for that organization, exerted himself vigorously to negotiate agreements with the

Austrian and Bulgarian governments whereby effective relief work might be conducted in Serbia.

Early in January, the Rockefeller Foundation contributed \$15,000 to the American Red Cross to be sent to Mr. Stuart for the purchase of supplies, Mr. Stuart at that time expecting to receive permission from Bulgaria to proceed with relief work. But the Bulgarian government declined to permit the Red Cross to furnish relief in that part of Serbia under its control. Mr. Stuart thereupon proceeded to Vienna where after extended negotiations he succeeded in making satisfactory arrangements with the military representatives for relief work in Belgrade. The distribution of food supplies by the Red Cross, assisted by a citizens' committee, commenced April 14, 1916.

Mr. Stuart succeeded also in securing an agreement permitting relief work in the interior of Serbia, in so far as it was controlled by the Austrian authorities. Upon receiving word to this effect from Mr. Stuart, the officials of the American Red Cross at Washington took steps to press forward the transportation to Serbia of the supplies which were shipped from New York by the steamer *Frixos* on January 1. These supplies had been diverted to the port of Marseilles where they were stored pending the outcome of the negotiations with the Austrian government. Dr. Edward W. Ryan, of the Red

Cross, who had done splendid work in Serbia in connection with the typhus epidemic, was in France when the arrangements for Serbian relief were successfully consummated. Under instructions from the Red Cross he arranged with the French and Swiss governments for the supplies to go forward from Marseilles into the territory of the Central Powers. There were about thirty carloads of supplies all told. They finally reached Belgrade about July 1.

The relief of the population of Belgrade proceeded smoothly under Mr. Stuart's direction during the year. Food was furnished at first to about 15,000 persons out of a total population of 50,000. This number increased steadily until September, 1916, when approximately 35,000 people were receiving relief. In July, 1916, the Foundation contributed an additional \$15,000 to the Red Cross for this work.

The extension of relief work to the interior of Serbia was fraught with difficulty. In the original agreement with Austria relief work outside of Belgrade was permitted only if supplies were furnished from this country. As it was impossible to secure the passage of supplies from this country to Serbia through the blockade it was necessary to secure a modification of the agreement permitting the purchase of foodstuffs in Roumania. Not until June 1 was the consent of the Austrian authorities secured to this change in the agreement. With the way open at last

for more comprehensive relief operations, plans were set afoot to establish an adequate relief organization for Serbia. These plans were being perfected rapidly when the declaration of war against the Central Powers by Roumania put a stop to their further consideration by cutting off the source of food supply. Dr. Ryan distributed in the interior of Serbia, however, the supplies brought overland from Marseilles. Mr. Stuart had succeeded in having shipped out of Roumania before war was declared all of the food which he had purchased there for the Serbians. This good fortune made it possible for him to continue his work in Belgrade until November 1.

The Director of the War Relief Commission reported in September that the crops in Serbia were excellent and would probably be sufficient to care for the needs of the population even though there were no other sources of food supply. He stated that there was great need for social service work in Serbia such as promoting the welfare of infants, caring for the aged and orphans, relieving the destitute, acting as an agency for the distribution of relief funds sent into Serbia by friends and sympathizers of the Serbian people. It was proposed to attempt to establish in Belgrade a commission charged with such duties, but the consent of the Austrian government has not yet been secured.

ARMENIAN AND SYRIAN RELIEF

During 1916, the Rockefeller Foundation contributed \$490,000 to the American Committee for Armenian and Syrian Relief, toward a total amount of approximately \$2,400,000. The relief work which this money has supported is divided into three main departments:

1. The relief of Armenians and other non-Moslem inhabitants of that part of Turkey which is within the control of the Constantinople government. In order to reach the centers of need the Committee has relied upon the American Embassy and upon the American Consuls and missionaries in touch with the Embassy.

2. The region in the Trans-Caucasus around Tiflis and such points of Armenia as have been brought within reach through Russia by the western advance of the Russian forces in Asia Minor. A very large refugee movement, amounting to some hundreds of thousands, took place at the time of the Armenian massacres and deportations. Relief in this section is administered by an American Committee, of which the American Consul, Mr. Felix Willoughby Smith, is Chairman.

3. Northwestern Persia: To this region there was a refugee movement consisting chiefly of Syrians who were driven out of their houses by the Kurds. The numbers suffering want in this region have probably been in the neighborhood of 60,000. A committee of missionaries, with

the co-operation of American consular officers, has administered relief in this section. A report received concerning the disbursement of the funds sent for use in this region during the summer of 1915 indicates that thousands of people were kept alive by the expenditure of about a cent and a half per day per capita.

Early in the year the Foundation made a small contribution toward the expenses of an English expedition to the Trans-Caucasus, Armenia and Northwestern Persia, for the purpose of ascertaining the need and appraising the efficiency of the various relief agencies. In the report of this committee appears a brief account of the work of the American relief agents. Mention is made of the emphasis laid by the American agents on the importance of encouraging self-help. To this end assistance was given in the form of loans of seed to be repaid in full out of the harvest, and loans of oxen at the rate of one yoke for three families with a scheme of payment beginning after the first year. The American Committee also made a special point of developing industrial work and employed a considerable number of men in gardening, sawing timber, joinery, etc. It has also assisted small tradesmen to re-open their shops for the benefit of themselves and the public.

The energy and devotion with which the American missionaries have worked under the stress of the past two years have been given at

a grave cost of life and health. During the congestion of refugees at Urumia, dysentery, typhus, and typhoid fever broke out. Many of the missionaries fell ill and five died of typhus.

In the latter part of the year, the American Committee for Armenian and Syrian Relief supplied the cargo for a relief ship, a government collier under Red Cross auspices, which sailed for Beirut about December 15th.

The collier reached Alexandria in safety, but has been unable to proceed further owing to the inability of the Turkish government to furnish a safe conduct for the ship to and from Beirut.

Owing to its increasing support of relief work in Turkey, and to the probability that aid would be required over a long period of time, the Rockefeller Foundation determined to send a representative to Constantinople to inform himself concerning the effectiveness of the various relief agencies, and to acquaint himself thoroughly with the conditions of destitution and disease. In April, Mr. Edward R. Stoever was appointed to represent the Rockefeller Foundation in Turkey. From 1911 to 1914, Mr. Stoever was the engineer in charge of the American Expedition to Sardis, where archaeological excavations were carried on under the direction of Professor Howard Crosby Butler of Princeton University.

Mr. Stoever reached Constantinople in July. Shortly after his arrival he found an opportunity to render service apart from his routine duties by

taking charge of the purchase and distribution of supplies for the prisoners of war interned in the interior of Turkey.

In November, in response to Mr. Stoever's cabled recommendation the Foundation appropriated \$100,000 to be spent for general relief purposes in Constantinople and other parts of Turkey. Twenty-five thousand dollars of this amount was forwarded at once to Mr. Stoever, the balance awaiting further reports from him as to the success of his endeavors.

In March, 1916, the Constantinople chapter of the American Red Cross cabled to that organization at Washington stating that the Turkish government would welcome the co-operation of the Red Cross with the Red Crescent in the conduct of relief work in Turkey for the civilians of all races. The cablegram stated that there was great suffering throughout the country, that hundreds of thousands needed food, and that many were dying of starvation. The Turkish government offered satisfactory guarantees covering the conduct of the work in Turkey. A conference was held of representatives of the various organizations doing relief work in Turkey and it was decided to send to Constantinople \$50,000 in response to the appeal. Toward this sum the Rockefeller Foundation contributed \$25,000.

PRISONERS OF WAR WELFARE WORK

The widespread activities of the International Committee of Young Men's Christian Associations in military and prisoner-of-war camps in the countries on both sides of the present struggle have continued to command sympathetic support from the Rockefeller Foundation. In Europe, Asia, and Africa representatives of the International Committee are working tirelessly making provision for the physical, mental, and moral welfare of the millions of men held as prisoners, and also for those comprising the vast armies facing each other in the various areas of conflict. Toward a total expenditure for welfare work in military and prisoner-of-war camps by the International Committee of Young Men's Christian Associations during 1916 of approximately \$900,000 the Rockefeller Foundation contributed \$200,000.

During the period of their service in Europe members of the War Relief Commission devoted a considerable part of their time to a thorough-going study of the question of welfare work among prisoners of war. They observed that while a few organizations, such as the International Committee of Young Men's Christian Associations and the International Red Cross at Geneva, were doing efficient work for prisoners of war sufficiently wide in scope to be of great value to all the belligerents, there was unfortunately a confusion of effort resulting from

attempts made by hundreds of small private and semi-private relief associations to aid in caring for the interests of the prisoners. It became apparent that proper co-ordination of the work could be brought about only by the building up of a single strong organization which would command the attention and respect of the belligerent powers.

In the latter part of the year, the Director of the War Relief Commission, who had returned from Europe to submit a report of the activities of the Commission, laid before the Trustees of the Foundation plans looking to the formation of a commission for the welfare of prisoners of war through the co-operation of the Foundation, the International Committee of Young Men's Christian Associations, and the International Red Cross at Geneva. The Trustees approved the plan in substance and authorized the Director of the War Relief Commission to undertake the necessary negotiations on behalf of the Foundation. Five hundred thousand dollars was appropriated to forward the plan if it should become effective. The Director of the Commission sailed for Europe on December 28 to initiate the negotiations.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH

During the year 1916 the Rockefeller Foundation continued the support, through the Rockefeller Institute for Medical Research, of the

investigations at the special hospital at Compiègne, France, to the direction of which the French Service de Santé had detailed Dr. Alexis Carrel. At this hospital Dr. Carrel and his staff continued their study of procedures for the sterilization and treatment of infected wounds. No successful preventive analogous to anti-tetanus serum has yet been discovered, nor has a prophylaxis been found against gas gangrene and the pus organisms with which most wounds are contaminated under conditions surrounding trench warfare. One of the greatest problems of modern war surgery has thus been that of sterilizing the already infected wounds. The procedures worked out by Dr. Henry D. Dakin and Dr. Alexis Carrel have produced excellent results. In connection with these studies Dr. Carrel and his assistants have also made studies on the healing process in wounds. Incidental to the work of the Compiègne hospital, studies on nervous shock and bacteriological studies of the gas organism were carried out by Dr. William T. Porter of the Harvard Medical School and Dr. J. P. Simonds of the North Western University Medical School. The Institute has used a part of the appropriation made by the Foundation to manufacture and supply meningitis serum and anti-dysentery serum to the British, French and Italian governments for use in their armies and in controlling epidemics.

References to the work of Dr. Carrel and his assistants, and Dr. Porter may be found in:

Journal of Experimental Medicine, November 1, 1916, Vol. 24, No. 5. Carrel, DuNouy and Hartmann.

Journal of Experimental Medicine, May, 1917, Vol. 25, No. 5. DuNouy.

Boston Medical and Surgical Journal, December 14, 1916. W. T. Porter.

To appear in *Journal of Experimental Medicine*, June, 1917. J. P. Simonds.

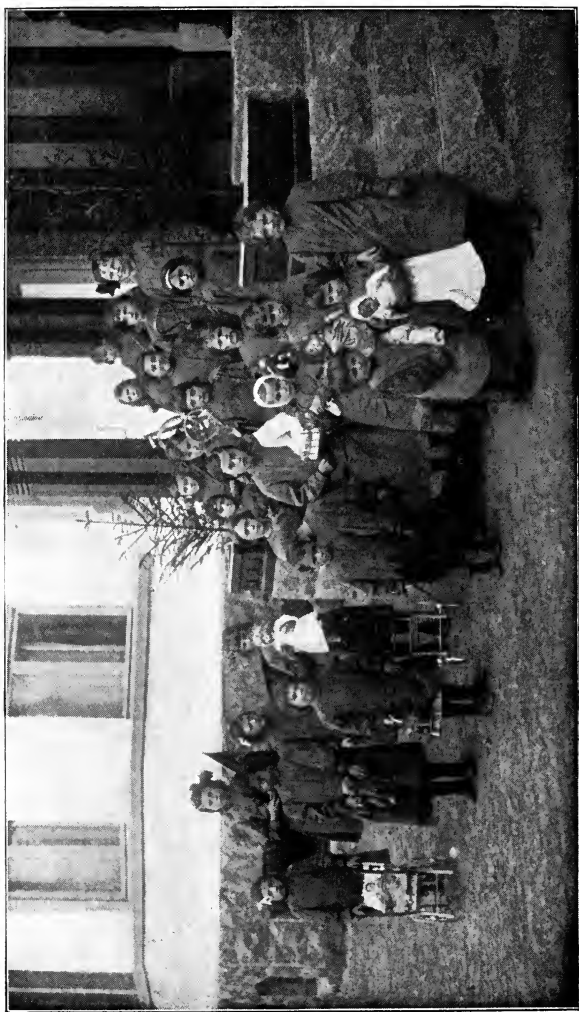
MISCELLANEOUS CONTRIBUTIONS

In order to make it possible for the Director of the War Relief Commission to contribute moderate sums of money to meritorious projects, where large questions of policy were not involved, and where prompt action was desirable, a fund of \$25,000 was placed at his disposal to be expended at his discretion for purposes of relief. The following gifts have been made by him from this fund.

Buxton Party—Armenian Refugees (Lord Mayor's) Fund, London...	\$487.00
American Benevolent Association, Berlin.....	475.00
Kriegsblindenheim, Berlin.....	475.00
Jewish Asylum, Warsaw.....	190.00
International Red Cross, Geneva ..	4,750.00
	<hr/>
	\$6,377.00



The villa at Fribourg where the Belgian children are housed



Some of the Belgian children at Fribourg, Switzerland, who are being cared for under the guarantee of the
Rockefeller Foundation



Dining-room in the villa



Dormitory in the villa

THE ROCKEFELLER FOUNDATION
Report of the Treasurer



TREASURER'S REPORT

NEW YORK, January 1, 1917.

To the Members of The Rockefeller Foundation:

Gentlemen:

Herewith I send you a report of the financial operations of the Rockefeller Foundation and its subsidiary organizations for the year ending December 31, 1916.

The income for the year from general funds was \$6,226,709.71; the balance from the previous year, after adding sundry refunds, was \$5,229,300.22; making a total of \$11,456,009.93 available for disbursement. The sum of \$6,065,847.99 was disbursed, including \$2,535,846.13 on account of Mr. Rockefeller's designations, leaving a balance of \$5,390,161.94, divided as follows;

Amount to the credit of Mr. Rockefeller's reservation	\$907,488.11
Amount payable on appropriations	4,099,482.86
Amount available for appropriation	383,190.97
	<hr/>
	\$5,390,161.94

The above figures do not take into account pledges amounting to \$1,284,189.94, payable in 1917, nor \$715,050, payable in 1918 and subsequent years.

The year's income of \$6,226,709.71 is \$2,043,625.52 in excess of that for the year 1915. This increase is accounted for as follows:

Decrease in amount of income credited to 1915 owing to change of method mentioned in report for that year	\$1,053,293.43
Income from bonds formerly in default, or from bonds received in exchange therefor, including arrears of 1914 and 1915 interest	657,675.00

Amount heretofore carried in suspense, representing 1914 and 1915 interest on St. Louis & San Francisco Refunding 4 % bonds—now credited to income by order of Finance Committee	\$120,000.00
Miscellaneous increases of divi- dends, and interest on addi- tional investments, etc.	212,657.09
	<hr/>
	\$2,043,625.52

The income from general funds for the year 1917 may be closely estimated at \$6,000,000.

The principal funds increased during the year from \$101,751,749.78 to \$102,034,447.79, a difference of \$282,698.01, as follows:

Gifts from the Estate of Laura S. Rockefeller	\$86,860.00
Net gain on securities sold, re- deemed and exchanged	432,970.39
Increased value of securities deliv- ered to beneficiary at market prices	12,867.62
	<hr/>
	\$532,698.01
Deduct appropriation from prin- cipal of Estate of Laura S. Rockefeller Fund	250,000.00
	<hr/>
Net gain	\$282,698.01

In addition to the above, the amount invested in lands, buildings, equipment and inventories increased during the year from \$319,241.04 to \$630,959.37, a difference of \$311,718.33. This sum was expended from income, as shown in Exhibit K.

The present financial condition of the Foundation and its operations during the year are set forth in the following exhibits:

Balance Sheet	Exhibit A
Receipts and Disbursements of In- come	Exhibit B

Foundation Appropriations.	Exhibit C
Mr. Rockefeller's Designations.	Exhibit D
International Health Board Disbursements.	Exhibit E
International Health Board Appropriations.	Exhibit F
China Medical Board Disbursements	Exhibit G
China Medical Board Appropriations	Exhibit H
War Relief Disbursements.	Exhibit I
Joint Account Belgian Children in Switzerland.	Exhibit I
War Relief Appropriations.	Exhibit J
Statements of Principal Funds.	Exhibit K
Land, Buildings and Equipment Fund.	Exhibit K
Finance Committee's Report of Transactions Relating to Invested Funds.	Exhibit L
Schedule showing Investment of General Funds.	Exhibit M
Schedule showing Investment of Special Funds.	Exhibit N

Respectfully submitted,

L. G. MYERS,

Treasurer.

EXHIBIT A

BALANCE SHEET

ASSETS

I. INVESTMENTS:

General Schedule (Exhibit M)	\$105,955,986.55	
Less amount of income investments (see below)	4,007,838.76	
	<hr/>	\$101,948,147.79
Special (Exhibit N)		86,300.00
		<hr/>
		\$102,034,447.79
		<hr/>

II. LAND, BUILDINGS, EQUIPMENT AND INVENTORIES
(Exhibit K)

\$630,959.37

III. INCOME ACCOUNTS:

CASH IN THE HANDS OF AGENTS, TO BE ACCOUNTED FOR, AND SUN-DRY ACCOUNTS RECEIVABLE:		
General Funds (Exhibit B)		\$437,557.41
CASH ON HAND:		
General Funds (Exhibit B)	\$445,480.58	
Special Funds (Exhibit B)	16,687.65	
Joint Account Belgian Children (Exhibit I)	48,750.00	
	<hr/>	510,918.23
CASH LOANED ON CALL		530,000.00
INCOME INVESTED TEMPORARILY (Exhibit M)		4,007,838.76
		<hr/>
		\$5,486,314.40
		<hr/>
GRAND TOTAL		\$108,151,721.56
		<hr/>

EXHIBIT A

DECEMBER 31, 1916

FUNDS AND OBLIGATIONS

I. FUNDS:

General Fund (Exhibit K).....	\$100,000,000.00	
Gift from Estate of Laura S. Rockefeller (Exhibit K).....	177,733.00	
Reserve (Exhibit K).....	1,770,414.79	
		<hr/>
		\$101,948,147.79
Special Funds (Exhibit K):		
Gifts from John D. Rockefeller...	\$37,000.00	
Gifts from Laura S. Rockefeller..	49,300.00	
		<hr/>
		86,300.00
		<hr/>
		\$102,034,447.79
		<hr/>

II. LAND, BUILDINGS AND EQUIPMENT FUND:

Appropriations from income (Exhibit K).....	
	<hr/>
	\$630,959.37
	<hr/>

III. INCOME ACCOUNTS:

Joint Account Belgian Children in Switzerland (Exhibit I).....		\$48,750.00
Sundry accounts payable.....		30,714.81
Income reserved for payment on account of Mr. Rockefeller's designations (Exhibit D).....	\$907,488.11	
*Balance payable on appropriations (Exhibit C).....	4,099,482.86	
*Income available for appropriation.....	383,190.97	
		<hr/>
		5,390,161.94
Balance of income:		
Gift of Estate of Laura S. Rockefeller (Exhibit B).....		16,687.65
		<hr/>
		\$5,486,814.40
		<hr/>
		\$108,151,721.56
		<hr/>

*It should be noted that appropriations payable in 1917 and subsequent years have already been made aggregating \$1,999,239.94 and that, as the balance of unappropriated income amounted to only \$383,190.97 on December 31, 1916, there is an excess of appropriations over income amounting to \$1,616,048.97 which represents an additional obligation of the Foundation payable out of its future income, except for such appropriations as may be canceled by the Foundation.

EXHIBIT B

STATEMENTS OF RECEIPTS AND DISBURSEMENTS OF
INCOME

GENERAL FUNDS

RECEIPTS

Balance January 1, 1916.....		\$5,009,007.82
Refunds from 1915 Accounts:		
Items charged as payments out of 1915 income now carried as accounts re- ceivable.....	\$191,617.92	
Unexpended appropriation for war re- lief.....	25,000.00	
Ying property in Peking, China.....	3,674.48	
	<hr/>	220,292.40
Total balance.....		<hr/> \$5,229,300.22
Income collected during the year.....		<hr/> 6,226,709.71

GRAND TOTAL..... \$11,456,009.93

EXHIBIT B

STATEMENTS OF RECEIPTS AND DISBURSEMENTS OF
INCOME

GENERAL FUNDS

DISBURSEMENTS

PAYMENTS MADE TO UNAFFILIATED ORGANIZATIONS ON ACCOUNT OF FOUNDATION APPROPRIATIONS (Exhibit C)		\$1,341,108.01
PAYMENTS ON ACCOUNT OF MR. ROCKEFELLER'S DESIGNATIONS (Exhibit D) . .		2,535,846.13
AFFILIATED ORGANIZATIONS AND ADMINISTRATION:		
International Health Board (Exhibit E).	\$505,900.99	
China Medical Board (Exhibit G)	549,558.57	
War Relief (Exhibit I)	966,667.55	
Industrial Relations	15,048.27	
Scientific Studies of Governmental Problems	50,000.00	
Secretary's office	\$80,179.08	
Treasurer's office	13,981.66	
	<u>94,160.74</u>	
		2,181,336.12
EQUIPMENT, ETC., CARRIED IN LAND, BUILDINGS AND EQUIPMENT FUND (Exhibit K)		
Furniture and fixtures	\$2,597.88	
Library	567.73	
Grand Chenier Tract—taxes, fees, etc. .	2,728.18	
Merchandise, drugs, etc.	1,663.94	
	<u>7,557.73</u>	
TOTAL DISBURSEMENTS		\$6,065,847.99
BALANCE:		
Securities (Exhibit M)	\$4,007,838.76	
Cash	445,480.58	
Call loans	530,000.00	
Accounts receivable	\$437,557.41	
Less accounts payable	30,714.81	
	<u>406,842.60</u>	
		5,390,161.94
GRAND TOTAL		<u><u>\$11,456,009.93</u></u>

EXHIBIT B

STATEMENTS OF RECEIPTS AND DISBURSEMENTS OF
INCOME

ESTATE OF LAURA S. ROCKEFELLER FUND

Income collected during the year	\$16,734.50
Less Balance of accrued interest on bonds in 1915	46.85
	<u>\$16,687.65</u>
Accounted for in cash on deposit	<u>\$16,687.65</u>

LAURA S. ROCKEFELLER FUNDS

Income collected during the year	\$3,000.00
Amount paid to the several societies des- ignated by Mrs. Rockefeller	<u>\$3,000.00</u>

JOHN D. ROCKEFELLER FUND

Income collected during the year	\$1,850.00
Amount paid to the society designated by Mr. Rockefeller	<u>\$1,850.00</u>

EXHIBIT C

FOUNDATION APPROPRIATIONS MADE IN 1916, UNPAID
BALANCES AND INSTALLMENTS OF APPROPRIATIONS
MADE IN PREVIOUS YEARS AND PAYMENTS
THEREON MADE IN 1916

TO UNAFFILIATED ORGANIZATIONS*	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
American Academy in Rome. (R.F. 215) For general purposes, \$10,000.00 a year for ten years be- ginning with 1914. (In- stallment due 1916)...	.....	\$10,000.00	\$10,000.00
American Social Hygiene Association (R.F. 2177) For cur- rent expenses 1915- 1916).....	.....	7,000.00	7,000.00
(R.F. 2188) For cur- rent expenses. Total pledge of \$20,000.00 ex- tending over two years. (First installment due 1916-1917).....	.....	10,000.00	10,000.00
Brooklyn Bureau of Char- ities. (R.F. 2189) For the after care of infantile paralysis cases. Total pledge of \$12,000.00 ex- tending over two years. (First installment due 1916).....	.....	6,000.00	6,000.00
Bureau of Municipal Re- search. (R.F. 251) For studies in New York State gov- ernment.....	\$1,225.00	.....	1,225.00
(R. F. 265) For construct- ive studies in govern- ment of New York, \$10,000.00 a year for five years beginning with 1915. (Install- ment due 1916).....	.....	10,000.00	10,000.00
CARRIED FORWARD.....	\$1,225.00	\$43,000.00	\$44,225.00

EXHIBIT C—Continued

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$1,225.00	\$43,000.00	\$44,225.00
Bureau of Municipal Re- search (Continued).			
(R.F. 295) For an in- vestigation of prisons of the State of New York.	2,000.00	.....	2,000.00
(R.F. 2102) For its New York City work, \$15,- 000.00 per year for four years beginning with 1916. (Installment due 1916).....	.....	15,000.00	15,000.00
(R.F. 2154) For an in- vestigation of prisons of the State of New York.	.....	1,000.00	1,000.00
Committee of Reference and Counsel of the An- nual Foreign Missions Conference of North America.			
(R.F. 228) For carrying on its program of co- operation and co-ordi- nation in foreign mis- sionary work of the principal American Mis- sion Boards. Total pledge of \$425,000.00 extending over a period of ten years beginning with 1914. (Installment due 1916).....	.....	50,000.00	50,000.00
General Education Board.			
(R.F. 2167) For its cor- porate purposes.....	.....	†250,000.00	†250,000.00
Johns Hopkins University.			
(R.F. 2170) For the es- tablishment and main- tenance of a School of Hygiene and Public Health.....	267,000.00	30,000.00
CARRIED FORWARD.....	\$3,225.00	\$626,000.00	\$392,225.00

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EXHIBIT C—Continued

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD	\$3,225.00	\$626,000.00	\$392,225.00
National Committee for Men- tal Hygiene.			
(R.F. 2107) For a survey under the direction of the committee of the care and treatment of insane in various states.	17,800.00	.....	15,000.00
(R.F. 2141) For adminis- tration expenses . . . . .	.04	7,000.00	7,000.00
(R.F. 2158) For a survey to determine the num- ber of mentally defect- ive persons in Nassau County . . . . .	.....	10,000.00	10,000.00
(R.F. 2168) To defray for one year the cost of a proposed psychiatric de- partment for the exam- ination of prisoners at Sing Sing Prison . . . . .	.....	10,000.00	5,000.00
(R.F. 2191) For the pur- pose of completing the survey of Cook County, Illinois, under the direc- tion of the Committee.	.....	3,000.00	3,000.00
(R.F. 2207) For the serv- ices of an expert to as- sist the Kentucky Com- mission on the Feeble- minded . . . . .	.....	4,000.00	4,000.00
National Committee for the Prevention of Blindness.			
(R.F. 233) For general purposes, \$5,000.00 a year for five years be- ginning with 1914. (In- stallment due in 1916).	.....	5,000.00	5,000.00
New Rochelle Department of Health.			
(R.F. 2182) For an inves- tigation of the sources of infantile paralysis in- fection in New Rochelle	.....	1,000.00	1,000.00
CARRIED FORWARD	\$21,025.04	\$666,000.00	\$442,225.00

EXHIBIT C—*Continued*

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$21,025.04	\$666,000.00	\$442,225.00
New York Association for Improving the Condi- tion of the Poor.			
(R.F. 239) For the pur- pose of providing pen- sions for dependent widows with families, \$20,000.00 a year for ten years beginning with 1915. (Installment due 1915).....	20,000.00	.....	20,000.00
(Installment due 1916)	.....	20,000.00	5,000.00
New York Committee on After Care of Infantile Paralysis Cases.			
(R.F. 2181) For the or- ganization of after care of infantile paralysis cases in New York City	.....	25,000.00	10,306.28
New York City Department of Health.			
(R.F. 2176) For an inves- tigation of the sources of infantile paralysis in- fection in New York City.....	.....	50,000.00	22,491.42
New York Palisades Inter- state Park Commission.			
(R.F. 2144) Toward the sum of \$5,000,000.00 to be used for the enlarge- ment and improvement of the Palisades Inter- state Park.....	.....	1,000,000.00	1,000,000.00
New York Training School for Dental Hygienists.			
(R.F. 2180) For adminis- tration expenses.....	.....	2,500.00	2,500.00
Police Department of New York.			
(R.F. 2197) Toward the cost of Christmas trees to be held in precinct station houses for the children of their neigh- borhoods.....	1,000.00	1,000.00
CARRIED FORWARD.....	\$41,025.04	\$1,764,500.00	\$1,503,522.70

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EXHIBIT C—Continued

TO UNAFFILIATED ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$41,025.04	\$1,764,500.00	\$1,503,522.70
Rockefeller Institute for Medical Research. (R.F. 2135) For its cor- porate purposes.....	1,000,000.00	.....	.....
(R.F. 2172) For current expenses.....	.....	80,000.00	.....
(R.F. 2173) For altera- tion of buildings.....	.....	80,303.72	.....
(R.F. 2184) For publica- tion of pamphlet on pol- iomyelitis.....	.....	5,000.00	3,561.72
(R.F. 2190) For experi- ments relating to polio- myelitis.....	.....	10,000.00	10,000.00
State Charities Aid Associa- tion. (R.F. 2187) For the or- ganization by the Asso- ciation, in co-operation with the State Depart- ment of Health, of the after care of infantile paralysis cases in New York State outside of New York City.....	.....	7,000.00	5,000.00
Wellesley College. (R.F. 234) Toward a fund for building and endowment.....	69,023.59	.....	69,023.59
	<u>\$1,110,048.63</u>		
Unexpended portion of ap- propriation allowed to lapse.....	.04	.....	.....
TOTAL.....	<u>\$1,110,048.59</u>	<u>\$1,946,803.72</u>	<u>†\$1,591,108.01</u>

*Other than war relief organizations.

†The appropriation of \$250,000 to the General Education Board was paid from the principal of the gift from the Estate of Laura S. Rockefeller (See Exhibit K). The balance of above total was paid from income from general funds (See Exhibit B).

EXHIBIT C—Continued

TO AFFILIATED ORGANIZATIONS AND ADMINISTRATION:	APPROPRIATED PRIOR TO 1916	APPROPRIATED DURING 1916	PAYMENTS DURING 1916
International Health Board.....	\$585,479.23	\$111,557.16	\$505,900.99
China Medical Board....	273,061.12	1,072,428.60	549,558.57
War Relief.....	30,000.01	2,590,000.00	966,667.55
Industrial Relations....	230.32	20,000.00	15,048.27
Scientific Studies Governmental Problems.....	40,000.00	24,000.00	50,000.00
Administration of Rockefeller Foundation.....	54,140.16	41,914.07	94,160.74
	<u>\$982,910.84</u>	<u>\$3,859,899.83</u>	<u>\$2,181,336.12</u>

UNEXPENDED PORTIONS OF
APPROPRIATIONS ALLOWED TO LAPSE (other than Unaffiliated and China Medical Board):

International Health Board.....	\$25,405.22
War Relief....	437.28
Administration of Rockefeller Foundation	1,895.01
	<u>\$27,737.51</u>
Less Item written off in 1916...	1.52
	<u>\$27,735.99</u>

<u>\$27,735.99</u>	<u>8,287.58</u>	<u>19,448.41</u>	<u>.....</u>
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TOTALS FOR ROCKEFELLER FOUNDATION AFFILIATED ORGANIZATIONS AND ADMINISTRATION..

<u>\$974,623.26</u>	<u>\$3,840,451.42</u>	<u>\$2,181,336.12</u>
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EXHIBIT C—Continued

SUMMARY

UNAFFILIATED ORGANIZATIONS:

Balances and installments of appropriations made prior to 1916.....	\$1,110,048.59	
Appropriations made in 1916.....	1,946,803.72	
		<u>\$3,056,852.31</u>

AFFILIATED ORGANIZATIONS AND ADMINISTRATION:

Balances of appropriations made prior to 1916.....	\$974,623.26	
Appropriations made in 1916.....	3,840,451.42	
		<u>4,815,074.68</u>

TOTAL APPROPRIATIONS.....		<u>\$7,871,926.99</u>
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Payments on account of appropriations to

Unaffiliated organizations.....	\$1,591,108.01
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Payments on account of appropriations for

Rockefeller Foundation affiliated organizations and administration.....	2,181,336.12
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TOTAL PAYMENTS.....		<u>3,772,444.13</u>
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BALANCE PAYABLE ON ALL APPROPRIATIONS.....		<u><u>\$4,099,482.86</u></u>
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In addition to the foregoing, Rockefeller Foundation pledges to unaffiliated organizations already reported will require for payment in future years the following amounts:—

Year 1917.....	\$1,103,552.94
Year 1918.....	110,000.00
Year 1919.....	100,000.00
Year 1920.....	70,000.00
Year 1921.....	65,000.00
Year 1922.....	60,000.00
Year 1923.....	55,000.00
Year 1924.....	15,000.00
	<u><u>\$1,578,552.94</u></u>

EXHIBIT D

PAYMENTS MADE TO UNAFFILIATED ORGANIZATIONS ON ACCOUNT OF MR. ROCKEFELLER'S DESIGNATIONS

Alta Social Settlement: toward the budget, \$24,083.75; toward the repair fund, \$2,500.00; toward their musical work, \$1,000.00	\$16,917.05
American Baptist Foreign Mission Society	175,000.00
American Baptist Home Mission Society	90,000.00
American Baptist Publication Society, for providing plates for publishing the Scriptures in foreign tongues, \$15,000.00	2,883.63
American Female Guardian Society and Home for the Friendless	500.00
Baptist Church Extension Society of Brooklyn and Queens	2,500.00
Baptist City Mission Society, Cleveland	5,000.00
Baptist Convention, Ohio	4,500.00
Baptist Convention, New Jersey	800.00
Baptist Ministers' Home Society	250.00
Baptist Ministers' and Missionaries' Benefit (North), to be invested and kept inviolable for the purpose of endow- ment, the income to be used for the corporate purposes of the Board	50,000.00
Baptist Missionary Convention of the State of New York	15,000.00
Baptist Missionary Society, New York City: To be applied to the Grace Church Build- ing Fund, \$3,732.00	\$746.40
For the work of the year	25,000.00
	<hr/> 25,746.40
Baptist State Mission Board of Pennsylvania	700.00
Baptist Union, Western Canada	10,000.00
Blue Ridge Association, toward the maintenance of the Social Service Summer School of the Association, \$3,000.00	1,000.00
Boy Scouts of America	9,500.00
Brooklyn Bureau of Charities	2,000.00
Brooklyn Federation of Jewish Charities	1,000.00
Bureau of Municipal Research, for the expenses of the Training School for Public Service, \$5,000.00	1,250.00
Charity Organization Society, New York City	6,000.00
Children's Aid Society	2,500.00
Cleveland Federation for Charity and Philanthropy	16,500.00
Cleveland School of Art	350.00
Community Chorus of New York City	500.00
Federated Churches of Cleveland	200.00
Foreign Mission Board of the Southern Baptist Con- vention, for the equipment of their work in foreign lands, \$100,000.00	31,047.84
George Junior Republic Association	2,500.00
	<hr/> \$174,144.42
CARRIED FORWARD	

EXHIBIT D—Continued

BROUGHT FORWARD.....	\$474,144.42	
Hospital Saturday and Sunday Association.....	5,000.00	
Laymen's Missionary Movement.....	6,550.00	
Legal Aid Society of New York.....	1,000.00	
National Association for the Study and Prevention of Tuberculosis.....	500.00	
National League on Urban Conditions Among Negroes....	3,000.00	
New York Association for Improving the Condition of the Poor.....	4,000.00	
New York Milk Committee.....	3,500.00	
New York School of Applied Design for Women.....	25,000.00	
Parks and Playgrounds Association of the City of New York.....	200.00	
Paul Kimball Hospital.....	200.00	
People's Institute.....	1,000.00	
Prison Association of New York.....	500.00	
Public Education Association of the City of New York, \$17,200.00.....	5,000.00	
Public Schools Athletic League.....	800.00	
Religious Education Association.....	750.00	
Rockefeller Institute for Medical Research: Toward the construction of new build- ings and endowment, \$2,550,000.00, Final payment.....	\$1,452,125.02	
For endowment.....	350,000.00	
For current expenses.....	24,501.69	
	<hr/>	1,826,626.71
State Charities Aid Association:		
For a trained agent to work among the poor children of Westchester County.....	\$300.00	
For expenses for the year.....	2,000.00	
	<hr/>	2,300.00
Superintendent of the Poor, Westchester County:		
For an additional eugenic investigator.....	\$225.00	
To be used for the care of the poor children of Westchester County who have been afflicted with infantile paralysis.....	1,000.00	
	<hr/>	1,225.00
Syrian Protestant College.....	5,000.00	
Travelers' Aid Society of New York.....	1,000.00	
Vassar College, for the cost of improve- ments and alterations in Rockefeller Hall.....	10,000.00	
Whittier House.....	1,000.00	
Working Women's Protective Union.....	50.00	
Young Men's Christian Associations:		
Brooklyn.....	\$1,000.00	
Cleveland.....	2,000.00	
New York City.....	6,000.00	
State Executive Committee, New York.....	1,000.00	
	<hr/>	
CARRIED FORWARD.....	\$10,000.00	\$2,378,346.13

EXHIBIT D—*Continued*

BROUGHT FORWARD.....	\$10,000.00	\$2,378,346.13
Young Men's Christian Association:		
Tarrytown.....	500.00	
University of Michigan, for land and building, \$60,000.00.....	30,000.00	
University of Minnesota, for building fund, \$50,000.00.....	25,000.00	
		<u>65,500.00</u>
Young Men's Christian Associations, International Committee of:		
For the work of the Foreign Department.....	\$35,000.00	
For the work of the Home Department.....	30,000.00	
For office expenses, \$25,000.00.....	10,000.00	
		<u>75,000.00</u>
Young Men's Christian Association (International College).....		2,000.00
Young Women's Christian Associations:		
National Board.....	\$10,000.00	
New York.....	5,000.00	
		<u>15,000.00</u>
		<u>\$2,535,846.13</u>
Balance subject to Mr. Rockefeller's designation, January 1, 1916.....	\$1,443,334.24	
Set aside for Mr. Rockefeller's designation during the year.....	2,000,000.00	
		<u>3,443,334.24</u>
Balance subject to Mr. Rockefeller's designation, January 1, 1917.....		<u>\$907,488.11</u>

EXHIBIT E

STATEMENT OF DISBURSEMENTS OF THE
INTERNATIONAL HEALTH BOARD
FOR THE YEAR 1916

HOOKWORM WORK:

Southern States:

Alabama.....	\$4,343.33	
Georgia.....	152.61	
Kentucky.....	7,920.78	
Louisiana.....	1,898.22	
Mississippi.....	7,041.21	
North Carolina.....	248.99	
South Carolina.....	9,039.06	
Tennessee.....	4,368.14	
Texas.....	5,446.18	
Virginia.....	8,522.92	
		<u>\$48,981.44</u>
CARRIED FORWARD.....		\$48,981.44

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EXHIBIT E—Continued

BROUGHT FORWARD.....		\$48,981.44
Central America:		
British Honduras.....	\$1,685.81	
Costa Rica.....	16,737.82	
Guatemala.....	12,474.83	
Nicaragua.....	19,199.78	
Panama.....	26,067.39	
Salvador.....	6,154.07	
		82,319.70
South America:		
Brazil.....	2,066.27	
		2,066.27
West Indies:		
Antigua.....	\$5,852.76	
Barbados—Survey.....	515.04	
British Guiana.....	19,236.11	
Dutch Guiana.....	8,429.93	
Grenada.....	11,384.96	
St. Lucia.....	5,520.71	
St. Vincent.....	4,094.97	
Trinidad.....	10,450.19	
Administration.....	6,552.40	
		72,037.07
The East:		
Ceylon.....	\$12,151.98	
Federated Malay States Hookworm		
Board.....	14,656.82	
Fiji Islands.....	2,795.96	
Seychelles Islands.....	3,369.46	
Siam.....	3,689.17	
Administration.....	13,961.92	
		50,625.31
MALARIA WORK:		
Arkansas.....	\$9,603.54	
Mississippi.....	37,687.83	
		47,291.37
YELLOW FEVER COMMISSION.....		40,395.84
INVESTIGATION OF SEWAGE DISPOSAL IN		
RURAL HOMES.....		664.39
MEDICAL COMMISSION TO BRAZIL.....		17,341.05
SALARIES AND TRAVELING EXPENSES OF		
DIRECTORS IN THE FIELD PAID FROM THE		
HOME OFFICE.....		64,890.56
ADMINISTRATION:		
Home office.....	\$60,916.37	
Survey and Education.....	17,633.62	
Panama Pacific Exhibition.....	738.00	
		79,287.99
		<u>\$505,900.99</u>

EXHIBIT F

INTERNATIONAL HEALTH BOARD APPROPRIATIONS
FOR WORK DURING THE YEAR 1916

Hookworm Work:

Southern States:

Kentucky.....	\$5,342.91
Louisiana.....	2,500.00
Mississippi.....	8,644.00
North Carolina.....	456.00
South Carolina.....	6,662.50
Tennessee.....	7,000.00
Texas.....	3,300.00
Virginia.....	7,741.64

\$41,647.05

Central America:

British Honduras.....	\$2,055.00
Costa Rica.....	22,760.00
Guatemala.....	15,020.00
Nicaragua.....	24,500.00
Panama.....	23,491.70
Salvador.....	15,871.00

103,197.70

South America:

Brazil.....	\$4,000.00
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4,000.00

West Indies:

Antigua.....	\$8,970.00
Barbados—Survey.....	600.00
British Guiana.....	24,428.00
Dutch Guiana.....	12,950.00
Grenada.....	10,814.40
St. Lucia.....	6,403.90
St. Vincent.....	9,444.00
Trinidad.....	18,870.00
Administration.....	7,760.00

100,240.30

The East:

Ceylon.....	\$17,680.00
Federated Malay States Hookworm Board.....	23,000.00
Fiji Islands.....	3,000.00
Java.....	2,000.00
Seychelles Islands.....	7,960.00
Siam.....	5,000.00
Administration.....	16,100.00

74,740.00

CARRIED FORWARD..... \$323,825.05

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EXHIBIT F—*Continued*

BROUGHT FORWARD.....		\$323,825.05
MALARIA WORK:		
Arkansas.....	\$19,300.00	
Mississippi.....	43,614.00	
	<hr/>	62,914.00
YELLOW FEVER COMMISSION.....		46,400.00
INVESTIGATION OF SEWAGE DISPOSAL AT RURAL HOMES.....		1,000.00
MEDICAL COMMISSION TO BRAZIL.....		18,570.00
SALARIES AND TRAVELING EXPENSES OF DIRECTORS IN THE FIELD PAID FROM THE HOME OFFICE.....		70,604.00
ADML. STRATION:		
Home Office.....	\$64,218.69	
Survey and Education.....	18,419.00	
	<hr/>	82,637.69
		<hr/>
		<u>\$605,950.74</u>

NOTES. Referring to the International Health Board totals given in Exhibit C, there was brought forward from 1915 a balance on appropriations amounting to \$85,479.23.

For the International Health Board's work during the year 1916 the Rockefeller Foundation appropriated \$500,000 in October 1915 and \$111,557.16 during 1916. Of the \$611,557.16 so appropriated by the Rockefeller Foundation the International Health Board appropriated for its 1916 work only \$605,950.74.

EXHIBIT G

STATEMENT OF DISBURSEMENTS OF THE CHINA
MEDICAL BOARD FOR THE YEAR 1916

ASSETS:

Property of Peking Union Medical College.....	\$148,783.83	
Property of Prince Yu.....	63,593.70	
Miscellaneous land purchases.....	1,076.71	
Purchase of land in China.....	64,417.38	
Property of Harvard Medical School.....	28,800.00	
Equipment.....	569.46	
	<hr/>	\$307,241.08

ACCESSORIES:

Red Cross Hospital.....	2,175.00
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ADVISORY FEES, ETC., OF ARCHITECT.....	12,960.00
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ADMINISTRATION OF MEDICAL INSTITUTIONS IN CHINA:

Peking Union Medical College:		
Budget 1915-16.....	\$36,440.72	
Less credits adjusting 1915-16 account.....	25,000.00	
	<hr/>	\$11,440.72
Budget 1916-17.....	7,259.89	
Reorganized Peking Union Medical College Budget 1916-17.....	4,190.18	
Red Cross Hospital 1916-17.....	9,332.11	
	<hr/>	32,222.90

ADMINISTRATION:

Home Office:		
Budget 1915-16.....	\$32,838.94	
Budget 1916-17.....	12,707.31	
Peking Office:		
Budget 1915-16.....	12,901.77	
Budget 1916-17.....	5,283.14	
	<hr/>	63,731.16

PAYMENTS ON ACCOUNT OF APPROPRIATIONS
TO UNAFFILIATED ORGANIZATIONS.....

131,228.43
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\$549,558.57
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EXHIBIT H

**CHINA MEDICAL BOARD APPROPRIATIONS MADE IN 1916,
UNPAID BALANCES AND INSTALLMENTS OF APPROPRIA-
TIONS MADE IN PREVIOUS YEARS AND PAYMENTS
THEREON MADE IN 1916**

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
MEDICAL EDUCATION:			
St. John's University of Penn- sylvania Medical School, Shanghai.			
(C.M. 2134) For salary of a teacher of anatomy and dissection.....	.....	\$1,500.00	\$1,500.00
Tsinanfu Union Medical Col- lege.			
(C.M. 251) For buildings and equipment.....	.....	50,000.00	20,000.00
(C.M. 252) For educating students sent to Tsinanfu by China Medical Board during a period of five years .....	.....	100,000.00	10,000.00
Yale Foreign Missionary So- ciety.			
(C.M. 27) For support of Hunan-Yale Medical School, Changsha, \$16,- 200.00 a year for five years beginning with 1915. (Balance of installment due 1915).....	\$9,594.10	.....	9,594.10
(Installment due 1916) ..	.....	16,200.00	8,100.00
(C.M. 2133) For labora- tory and equipment at medical school Changsha.	.....	30,000.00	.....
TRANSLATION:			
Nurses' Association of China.			
(C.M. 250) For salaries of writer and translator of nursing textbooks.....	.....	700.00	700.00
(C.M. 2135) Dr. P. B. Cousland, nursing text- books.....	.....	2,500.00	1,618.64
SCHOLARSHIPS:			
Students of the Harvard Med- ical School in China.....	.....	6,600.00	3,626.69
Chinese pharmacists.....	3,900.00	600.00	2,301.00
Chinese nurses.....	2,550.00	.....	950.00
CARRIED FORWARD.....	\$16,044.10	\$208,100.00	\$58,390.43

EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$16,044.10	\$208,100.00	\$58,390.43
FELLOWSHIPS:			
Medical missionaries and nurses on furlough.....	1,000.00	26,750.00	15,733.32
Medical fellowships, Chinese. (C.M. 218) Miscellaneous fellowships.....	2,945.83	9,400.00	7,283.15
	8,465.00	.....	3,370.00
MISSIONARY SOCIETIES:			
American Baptist Foreign Mission Society. (C.M. 276) Ningpo Hospi- tal, for salaries of doctor and nurse \$2,250.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	2,250.00	.....
(C.M. 277) Shaohsing Hospital, for support of foreign nurse, Chinese business manager and foreign doctor, \$2,475.00 a year for five years begin- ning with 1916. (Install- ment due 1916).....	.....	2,475.00	.....
(C.M. 278) Shaohsing Hospi- tal, for equipment and residences for Chinese staff, nurse, and physician .....	.....	8,512.50	.....
American Board of Commis- sioners for Foreign Mis- sions. (C.M. 294) Tehchow Hos- pital, for salary of two doctors, \$3,236.00 a year for five years beginning with 1915. (C.M. 211) (Balance of Installment due 1915).....	2,636.00	.....	454.00
(Installment due 1916) ..	.....	3,236.00	.....
(C.M. 296) Tehchow Hospi- tal, for capital expendi- tures.....	.....	4,633.50	4,633.50
(C.M. 297) Tehchow Hospi- tal, for employes' sala- ries, \$3,951.00 a year for five years beginning with 1916. (Installment due 1916).....	3,951.00	987.75
CARRIED FORWARD.....	\$31,090.93	\$269,308.00	\$90,852.15

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EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$31,090.93	\$269,308.00	\$90,852.15
MISSIONARY SOCIETIES (Cont.):			
American Board of Commis- sioners for Foreign Mis- sions. <i>Continued.</i>			
(C.M. 2140) Tehchow Hospi- tal, for doctor's residence	.....	3,000.00	3,000.00
Board of Foreign Missions, Methodist Episcopal Church.			
(C.M. 2102) Peking, sal- ary of two doctors; Chan- gli, salary of physician and foreign nurse; Taianfu, salary of physician and foreign nurse, \$11,800.00 a year for five years begin- ning with 1915. (C.M. 223) (Installment due 1915).....	11,800.00	.....	.....
(Installment due 1916) ..	.....	11,800.00	.....
(C.M. 283) Wuhu Hospi- tal, for salary and allow- ance of doctor, \$825.00 a year for five years begin- ning with 1916. (Install- ment due 1916).....	.....	825.00	.....
Board of Foreign Missions, Methodist Episcopal Church, South.			
(C.M. 2105) Soochow Hospital, for nurse's resi- dence, outfit, traveling expenses and medical al- lowance, \$3,500.00; for salary, \$600.00 a year for five years beginning with 1916. (C.M. 236) (In- stallment due 1916).....	.....	4,100.00	1,100.00
Board of Foreign Missions, Presbyterian Church, in the United States.			
(C.M. 284) Chefoo Hospi- tal, for salary and allow- ance of doctor and nurse \$2,625.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	2,625.00	.....
CARRIED FORWARD.....	\$42,890.93	\$291,658.00	\$94,952.15

EXHIBIT H—*Continued*

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$42,890.93	\$291,658.00	\$94,952.15
MISSIONARY SOCIETIES (<i>Cont.</i>):			
Board of Foreign Missions, Presbyterian Church, in the United States. <i>Con- tinued.</i>			
(C.M. 285) Hwaiyuen Hospi- tal, salary and allowances of physician and nurse, and running expenses, \$3,375.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	3,375.00	.....
(C.M. 286) Hwaiyuen Hospital, for residence of doctor and equipment ...	.....	5,250.00	.....
(C.M. 287) Paotingfu Hos- pital, for equipment and repairs .....	.....	3,877.50	3,760.00
(C.M. 295) Paotingfu, for salary of doctor and two nurses and residence; Shuntehfu, for salary of doctor and two nurses and residence. Salaries \$9,200.00 a year for five years beginning with 1915. (C.M. 214) (Installment due 1915)	17,200.00	.....	12,800.00
(Installment due 1916) ..	.....	9,200.00	.....
(C.M. 2141) Shuntehfu Hospital, for repairs and equipment .....	.....	6,452.93	6,452.93
(C.M. 2142) Shuntehfu Hospital, for mainte- nance expenses, \$750.00 a year for five years be- ginning with 1916. (In- stallment due 1916) .....	.....	750.00	750.00
(C.M. 2143) Paotingfu Hospital .....	.....	6,000.00	6,000.00
(C.M. 2144) Changteh Hos- pital, for current expenses, \$2,625.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	2,625.00	825.00
(C.M. 2145) Changteh Hospital, for capital ex- penditures .....	.....	13,050.00	.....
CARRIED FORWARD	\$60,090.93	\$342,238.43	\$125,540.08

EXHIBIT H—*Continued*

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DURING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$60,090.93	\$342,238.43	\$125,540.08
MISSIONARY SOCIETIES (<i>Cont.</i>):			
Board of Missions, Methodist Episcopal Church, South-American Baptist Foreign Mission Society, jointly.			
(C.M. 2151) New Union Hospital at Huchow, for building and equipment, \$20,000.00 (1917).....	.....	.....	.....
(C.M. 2152) Hospital at Huchow, for support of a foreign physician, \$5,025.00 extending over a period of five years beginning with 1917.....	.....	.....	.....
(C.M. 2153) Hospital at Huchow, for support of a foreign nurse, \$3,000.00 extending over a period of five years beginning with 1917.....	.....	.....	.....
(C.M. 2154) Hospital at Huchow, for support of a Chinese physician, \$2,250.00 extending over a period of five years beginning with 1917.....	.....	.....	.....
Canton Christian College.			
(C.M. 2139) Canton Hospital, for a business manager and current expenses, \$4,500.00 a year for five years beginning with 1916. (Installment due 1916) ..	.....	4,500.00	.....
Church of Scotland Foreign Mission Committee.			
(C.M. 288) Ichang Hospital, for equipment.....	.....	375.00	.....
(C.M. 289) Ichang Hospital, for support of a third foreign doctor and nurse, \$2,250.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	2,250.00	.....
CARRIED FORWARD.....	\$60,090.93	\$349,363.43	\$125,540.08

EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRIA- TED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$60,090.93	\$349,363.43	\$125,540.08
MISSIONARY SOCIETIES (Cont.):			
Executive Committee of For- eign Missions of the Pres- byterian Church in the United States (South).			
(C.M. 2101) Soochow, for salaries, outfits and travel to field of doctor and for- eign nurse; Kashing, for salary, outfit and travel to field of foreign nurse. Salaries \$3,600.00 a year for five years beginning with 1915. (C.M. 221) (Installment due 1915)...	4,450.00	.....	300.00
(Installment due 1916)...	.....	3,600.00	.....
(C.M. 234) Hospital in Kashing, X-ray outfit ...	.....	2,552.77	2,552.35
Foreign Christian Missionary Society.			
(C.M. 235) Luchowfu Hospital, for support of a Chinese physician .....	.....	120.00	120.00
(C.M. 269) Luchowfu Hospital, for support of a Chinese physician .....	.....	80.00	80.00
(C.M. 2100) Luchowfu, for salaries, allowances and outfit of doctor and nurse; Nantungchow, for salary, allowance and outfit of nurse. Salaries and al- lowances \$4,200.00 a year for five years beginning with 1915. (C. M. 215) (Installment due 1915)...	4,600.00	.....	.....
(Installment due 1916)...	.....	4,200.00	.....
(C.M. 2146) Luchowfu Hospital, for support of a Chinese doctor .....	.....	336.00	336.00
CARRIED FORWARD.....	\$69,140.93	\$360,252.20	\$128,928.43

EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$69,140.93	\$360,252.20	\$128,928.43
MISSIONARY SOCIETIES (Cont.):			
Foreign Mission Board, South- ern Baptist Convention.			
(C.M. 2103) Warren Me- morial Hospital, Hwan- ghien, for outfit and travel of a nurse, \$400.00. Sal- ary \$600.00 a year for five years beginning with 1916. (C.M. 225) (In- stallment due 1916).....	.....	1,000.00	400.00
(C.M. 2106) For outfit and travel of a doctor at Chengchow \$1,000, for salary \$1,200.00 a year for five years beginning with 1916. (C.M. 228) (Installment due 1916) ..	.....	2,200.00	1,350.00
(C.M. 2104) Yangchow Hospital, for outfit and travel of a nurse \$400.00. Salary \$600.00 a year for five years beginning with 1916. (C.M. 232) (Installment due 1916) ..	.....	1,000.00	550.00
(C.M. 279) Laichowfu Hospital, for salary of ad- ditional physician and wife, and nurse, \$1,650.00 a year for five years be- ginning with 1916. (In- stallment due 1916).....	.....	1,650.00	.....
(C.M. 280) Laichowfu Hospital, for equipment and outgoing expenses of a physician and wife.....	.....	750.00	.....
(C.M. 281) Hwanghien Hospital, for salary of physician, \$900.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	900.00	.....
(C.M. 282) Hwanghien Hospital, for outfit and travel of a physician.....	.....	750.00	.....
CARRIED FORWARD.....	\$69,140.93	\$368,502.20	\$131,228.43

EXHIBIT H—Continued

TO UNAFFILIATED PERSONS AND ORGANIZATIONS	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$69,140.93	\$368,502.20	\$131,228.43
MISSIONARY SOCIETIES (Cont.):			
Kuling Medical Missionary Association.			
(C.M. 21) For equipment of laboratory.....	1,000.00	.....	.....
London Missionary Society.			
(C.M. 2167) Siaochang Hospital, for support of an additional nurse. \$600.00 a year for five years beginning with 1917	.....	.....	.....
University of Nanking.			
(C.M. 2137) For current expenses of its hospital, \$9,250.00 a year for five years beginning with 1916. (Installment due 1916).....	.....	9,250.00	.....
(C.M. 2138) For buildings and equipment.....	.....	25,000.00	.....
	<u>\$70,140.93</u>	<u>\$402,752.20</u>	
Unexpended portions of ap- propriations allowed to lapse	1,376.44	1,550.42	
	<u>\$68,764.49</u>	<u>\$401,201.78</u>	<u>\$131,228.43</u>

TO AFFILIATED ORGANIZATIONS AND ADMINISTRATION	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
ASSETS:			
Peking Union Medical College.			
(C.M. 212-213) Purchase of property.....	\$173,300.00	\$6,000.00	\$148,783.83
(C.M. 239) Purchase of property of Prince Yu...	.....	125,000.00	63,593.70
(C.M. 248) Purchase of land adjoining Peking Union Medical College...	.....	1,080.00	.....
(C.M. 249) Miscellane- ous land purchases.....	.....	20,000.00	1,076.71
(C.M. 224) Discretionary emergency fund.....	50,000.00	.....	.....
(C.M. 2165) Plans for hos- pital and laboratory at Peking.....	1,000.00
CARRIED FORWARD.....	\$223,300.00	\$153,080.00	\$213,454.24

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EXHIBIT H—Continued

TO AFFILIATED ORGANIZATIONS AND ADMINISTRATION	APPROPRI- ATED PRIOR TO 1916	APPROPRI- ATED DUR- ING 1916	PAYMENTS DURING 1916
BROUGHT FORWARD.....	\$223,300.00	\$153,080.00	\$213,454.24
ASSETS (Cont.):			
(C.M. 2110) Purchase of land in China.....		260,000.00	64,417.38
(C.M. 227) Property of Harvard Medical School ..		28,800.80	28,800.00
Equipment.			
(C.M. 2166) Furniture and Fixtures.....		600.00	569.46
ACCESSORIES:			
Peking Union Medical College.			
(C.M. 266) Equipment purchased of American Presbyterian Mission....		1,141.26	
(C.M. 2161) Preparatory school in Peking, supplies, etc.....		15,000.00	
Red Cross Hospital, Shanghai.			
(C.M. 2109) Automobiles and ambulance.....		2,685.00	2,175.00
ADVISORY FEES, ETC., OF ARCHITECT		12,960.00	12,960.00
ADMINISTRATION OF MEDICAL INSTITUTIONS IN CHINA:			
Peking Union Medical Col- lege.			
Budget 1915-16.....	25,594.86	6,396.83	11,440.72
Budget 1916-17.....		66,000.00	7,259.89
Reorganized Peking Union Medical College.			
Budget 1916-17.....		16,502.50	4,190.18
(C.M. 2162) Preparatory school in Peking, to be es- tablished during 1917, for maintenance, \$26,000.00			
Red Cross Hospital, Shanghai, 1916-17.....		29,000.00	9,332.11
ADMINISTRATION:			
Home Office.			
Budget 1915-16.....		44,485.75	32,838.94
Budget 1916-17.....		23,252.83	12,707.31
Peking Office.			
Budget 1915-16.....	6,000.00	7,500.00	12,901.77
Budget 1916-17.....		15,500.00	5,283.14
	\$254,894.86	\$682,904.97	
Unexpended portions of appro- priations allowed to lapse..	50,598.23	11,678.15	
	\$204,296.63	\$671,226.82	\$418,330.14

EXHIBIT H—*Continued*

SUMMARY

UNAFFILIATED ORGANIZATIONS:

Balances and installments of appropriations to unaffiliated organizations made prior to 1916.....	\$68,764.49	
Appropriations made in 1916.....	401,201.78	
		<hr/> \$469,966.27

AFFILIATED ORGANIZATIONS AND ADMINISTRATION

Appropriations for affiliated organizations and for administration at home and in China prior to 1916.....	\$204,296.63	
Appropriations made in 1916.....	671,226.82	
		<hr/> \$875,523.45
TOTAL APPROPRIATIONS.....		<hr/> \$1,345,489.72
Payments on account of appropriations to unaffiliated organizations.....	\$131,228.43	
Payments on account of appropriations to affiliated organizations and for administration at home and in China....	418,330.14	
		<hr/> \$549,558.57
TOTAL PAYMENTS.....		<hr/> \$549,558.57
BALANCE PAYABLE ON CHINA MEDICAL BOARD APPROPRIATIONS.....		<hr/> <hr/> \$795,931.15

In addition to the foregoing, China Medical Board pledges to unaffiliated organizations already reported will require for payment in future years the following amounts:

Year 1917.....	\$180,637.00
Year 1918.....	98,837.00
Year 1919.....	94,537.00
Year 1920.....	43,901.00
Year 1921.....	2,775.00
	<hr/> \$420,687.00

EXHIBIT I

STATEMENT OF DISBURSEMENTS FOR WAR RELIEF FOR
THE YEAR 1916

ARMENIAN AND SYRIAN RELIEF		\$490,000.00
BELGIAN RELIEF:		
Belgian University Professors	\$5,000.00	
Belgian Children	25,000.00	
		<u>30,000.00</u>
INTERNATIONAL COMMITTEE OF YOUNG MEN'S CHRISTIAN ASSOCIATION		295,000.00
POLISH RELIEF		25,531.32
PRISONERS OF WAR WELFARE WORK		378.00
SERBIAN RELIEF		59,562.72
TURKISH RELIEF (American Red Cross)		25,000.00
OTHER SMALL CONTRIBUTIONS:*		
Buxton Expedition for Armenian Re- lief	\$487.00	
American Benevolent Association, Berlin	475.00	
Kriegsblindenheim, Berlin	475.00	
Jewish Asylum, Warsaw	190.00	
International Red Cross, Geneva	4,750.00	
		<u>6,377.00</u>
WAR RELIEF COMMISSION:		
Administration, At Home	\$24,377.82	
Administration, Abroad	10,440.69	
		<u>34,818.51</u>
		<u>\$966,667.55</u>
<hr/>		
JOINT ACCOUNT BELGIAN CHILDREN IN SWITZERLAND:		
Belgian Relief Committee (New York) ...	\$25,000.00	
Belgian Relief Committee (New England)	10,000.00	
Refugees' Relief Fund	3,000.00	
		<u>\$38,000.00</u>
Appropriation R.F. 2178 of Rockefeller Foundation included in above as an expenditure		25,000.00
		<u>\$63,000.00</u>
TOTAL		14,250.00
Payments		<u>\$48,750.00</u>
Balance		<u>\$48,750.00</u>

*Contributed by the Director of the War Relief Commission from a fund of \$25,000 appropriated March 14, 1916, to be expended at his discretion.

EXHIBIT J

APPROPRIATIONS FOR WAR RELIEF MADE DURING THE
YEAR 1916

BELGIAN RELIEF:

Stipends for Belgian professors in Eng- land (R.F. 2139, \$5,000.00; R.F. 2192, \$10,000.00)	\$15,000.00
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Belgian Children:

For the protection, maintenance and education of 500 Belgian children in Switzerland	25,000.00
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Contributions from other agencies for
this purpose have been received as
follows:

Belgian Relief Fund of New York City	\$25,000.00
New England Belgian Relief Fund	10,000.00
Refugees Relief Fund	3,000.00

\$38,000.00

SERBIAN RELIEF:

To the American Red Cross for Relief of destitution (R.F. 2136, \$15,000.00; R.F. 2174, \$15,000.00)	30,000.00
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ARMENIAN AND SYRIAN RELIEF:

Contributed for the relief of the non- Moslem population within the Turkish Empire, and in Northwestern Persia and Caucasus (R.F. 2137, \$25,000.00; R.F. 2138, \$10,000.00; R.F. 2146, \$30,000.00; R.F. 2155, \$50,000.00; R.F. 2161, \$50,000.00; R.F. 2164, \$25,000.00; R.F. 2171, \$100,000.00; R.F. 2185, \$200,000.00; R.F. 2192A, \$100,000.00)	590,000.00
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INTERNATIONAL COMMITTEE OF YOUNG
MEN'S CHRISTIAN ASSOCIATIONS:

For the establishment of Y. M. C. A. or- ganizations and buildings in military and prisoners' camps in Europe (R.F. 2143, \$50,000.00; R.F. 2166, \$100,- 000.00; R.F. 2169, \$50,000.00)	200,000.00
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For the establishment and maintenance of recreation centers in connection with the military forces on the Mexican border (R.F. 2175, \$50,000.00; R.F. 2195, \$50,000.00)	100,000.00
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CARRIED FORWARD	\$960,000.00
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EXHIBIT J—*Continued*

BROUGHT FORWARD		\$980,000.00
For the purchase and administration of suitable collections of books to be maintained at the several brigade head- quarters along the Mexican border (R.F. 2179)		15,000.00
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH:		
Surgical Laboratory at Compiègne, under the direction of Dr. Alexis Carrel (R.F. 2142)		25,000.00
POLISH RELIEF:		
For relief work in Poland, Serbia, Monte- negro and Albania (R.F. 2165)		1,000,000.00
PRISONERS OF WAR WELFARE WORK:		
R.F. 2193 Administration	\$300,000.00	
R.F. 2194 Supply Division	200,000.00	
	<hr/>	500,000.00
TURKISH RELIEF (American Red Cross):		
For relief work in and about Constanti- nople (R.F. 2160)		25,000.00
GENERAL RELIEF WORK:		
At the discretion of the Director of the War Relief Commission (R.F. 2157) ...		25,000.00
WAR RELIEF COMMISSION:		
Administration (R.F. 2156, \$20,000.00; R.F. 2209, \$20,000.00)		40,000.00
		<hr/>
		\$2,590,000.00

NOTE. Referring to the War Relief totals given on page 354; there was brought forward from 1915 a balance on appropriations amounting to \$30,000.01.

EXHIBIT K

STATEMENTS OF PRINCIPAL FUNDS

GENERAL FUNDS

GIFTS FROM MR. JOHN D. ROCKEFELLER

Gifts from May 29, 1913, to December 31, 1916.....	<u>\$100,000,000.00</u>
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The total fund is invested in the securities listed in General Schedule, Exhibit M.....	<u>\$100,000,000.00</u>
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ESTATE OF LAURA S. ROCKEFELLER FUND

Gifts to January 1, 1916.....	\$340,873.00
Received during year in securities, interest and cash.....	<u>86,860.00</u>

	\$427,733.00
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Appropriated and paid to General Education Board.....	<u>250,000.00</u>
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	<u>\$177,733.00</u>
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The total fund is invested in the securities listed in General Schedule, Exhibit M.....	<u>\$177,733.00</u>
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RESERVE

Balance January 1, 1916.....	\$1,324,576.78
Gains on securities sold and redeemed during the year 1916.....	<u>445,838.01</u>

	<u>\$1,770,414.79</u>
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The total fund is invested in the securities listed in General Schedule, Exhibit M.....	<u>\$1,770,414.79</u>
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SPECIAL FUNDS

LAURA S. ROCKEFELLER FUNDS

Gifts.....	<u>\$49,300.00</u>
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Invested in securities listed in Exhibit N.....	<u>\$49,300.00</u>
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JOHN D. ROCKEFELLER FUND

Gifts.....	<u>\$37,000.00</u>
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Invested in securities listed in Exhibit N.....	<u>\$37,000.00</u>
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EXHIBIT K—Continued

LAND, BUILDINGS AND EQUIPMENT FUNDS

Income appropriated up to December 31, 1915	\$319,241.04
Additional sum carried to the account from 1915 expenditures . .	<u>594.00</u>
	\$319,835.04
Less refund on account of purchase of the Ying property in 1915 . . .	<u>3,674.48</u>
	\$316,160.56

Income appropriated in 1916:	
Land, buildings, equipment, merchandise, drugs, etc., at home office (Exhibit B)	\$7,557.73
China Medical Board assets (Exhibit G)	<u>307,241.08</u>
	314,798.81
	<u>\$630,959.37</u>

Assets in account December 31, 1916:

Rockefeller Foundation:

Grand Chenier Tract (Land, taxes, fees, etc.)	\$233,874.47
Furniture and fixtures	15,026.04
Library, New York City	893.28
Inventory, drugs, etc.	<u>13,599.22</u>
	\$263,393.01

China Medical Board:

Property of Peking Union Medical College	\$188,678.95
Property of Mr. Yu at Peking, China	63,593.70
Property of Mr. Ying at Peking, China	<u>20,381.51</u>
Property of Harvard Medical School	28,800.00
Equipment—New York City	618.11
Purchase of land in China	64,417.38
Miscellaneous land purchases	<u>1,076.71</u>
	367,566.36
	<u>\$630,959.37</u>
	<u>\$630,959.37</u>

EXHIBIT L

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS

The Finance Committee reports the following transactions relating to invested funds, which occurred during the year 1916:

On January 19, the Executors of the Estate of Laura S. Rockefeller made a further gift to the Foundation, consisting of securities, as shown in the following tables, having a market value of \$49,458.05, and accrued dividends of \$401.95.

During March, the Foundation, by reason of its ownership of \$1,065,000.00 Erie R.R. convertible 4% bonds, and 21,400 shares Erie R.R. first preferred stock, received from the company the privilege of subscribing to \$391,500.00 of its new convertible bonds. This "right" was sold and the proceeds credited to the cost of the bonds and stocks on account of which it was issued.

During April, the Foundation received from the National Transit Company \$1,581,012.50, or \$12.50 per share, in cash, representing a distribution of the assets of the company, thereby reducing the par value of the stock from \$25.00 to \$12.50. The number of shares held by the Foundation remains the same (126,481) but the valuation is reduced by \$12.50 per share.

During May, the Foundation received from the Cleveland Trust Company a further sum of \$4,790.04, on account of the liquidation of the assets of the Euclid Heights Realty Company. The book value of the bonds representing the Foundation's interest in these assets having been already received, this sum was added to Reserve.

On June 1, the Foundation gave to the General Education Board, from the Estate of Laura S. Rockefeller Fund, securities and accrued interest amounting to \$250,000.00. A list of these securities is given in the following pages.

During June, thirteen hundred and eighty shares of new capital stock of the Chesebrough Manufacturing Company were received as a dividend and were added to the 690 shares already held. The total of 2,070 shares are now carried at the valuation of the original number.

On June 28, the Executive Committee adopted a resolution providing for the merging, into one general investment account, of the investments of the several funds heretofore received, or to be received, with the exception of those cases in which the conditions of a gift require the separate investment thereof. In accordance with this action the securities received from the Estate of Laura S. Rockefeller have been merged with the investments belonging to the General Funds.

During August eighty-six hundred and ninety-six shares of new capital stock of the Standard Oil Company (Ohio) were received as a dividend and were added to the 8,696 shares already held. The total of 17,392 shares are now carried at the valuation of the original number.

During September the Foundation received from the Executors of the Estate of Laura S. Rockefeller cash amounting to \$37,000.00, as an additional gift.

During October the Receiver of the International Mercantile Marine Company was discharged and the administration of the company resumed by its stockholders. Under a compromise agreement its International Navigation 5% bonds and its International Mercantile Marine

EXHIBIT L—*Continued*

4½% bonds were paid off as follows: 57% of the par of the above bonds in new collateral 6% bonds and 43% in cash, while all arrearages of interest were paid in cash. For its holdings of \$3,692,000.00 4½% bonds and \$1,305,000.00 5% bonds, the Foundation received \$2,848,290.00 in new 6% bonds and \$2,148,710.00 in cash. The new bonds have been given a valuation of 97.50%, which was the market value on the day of receipt. Arrearages of interest amounting to \$559,419.03 have been credited to Income Account.

During October, the reorganization of the Western Pacific Railway Company having been completed, the Foundation's holding of \$4,039,000.00 first mortgage 5% bonds were exchanged for 20,195 shares of preferred stock and 30,292½ shares of common stock of the new Western Pacific Railroad Company. These stocks were taken into the books at their market values on the day of receipt, namely 43½% and 15½%, respectively.

During the month of November the completion of the reorganization of the St. Louis & San Francisco Railroad Company resulted in the exchange of the Foundation's \$2,000,000.00 refunding 4% bonds for \$1,500,000.00 prior lien 4% bonds and \$500,000.00 adjustment mortgage cumulative 6% bonds of the new St. Louis & San Francisco Railway Co. These bonds were taken into the books at their market values on the day of receipt, namely, 72½% and 81.975% respectively.

To offset arrearages of interest on the refunding bonds above mentioned, one year's interest to July 1, 1916, on the two new issues was paid by the company. The amount received, together with the proceeds of sale of coupons representing three interest periods of the refunding bonds, until now carried in a suspense account, have been credited to income account.

The reorganization of the New Orleans, Texas & Mexico Railroad Company was consummated during the month of November, and in exchange for its holding of \$450,000.00 St. Louis & San Francisco, New Orleans, Texas & Mexico Division first mortgage 5% bonds, the Foundation received \$180,000.00 5% income bonds and 1,125 shares of the capital stock of the New Orleans, Texas & Mexico Railway Company. These securities were taken into the books at their market values on the day of receipt, namely, 42% and 16% respectively.

The following tables of sales and purchases state the above transactions in brief and give the profits and losses on the various securities sold, redeemed and exchanged.

EXHIBIT L—Continued

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS

SECURITIES SOLD, REDEEMED AND EXCHANGED				TOTAL	
NAME	RATE PER CENT	PROCEEDS			
\$6,000 Baltimore & Ohio R.R. First	4	\$5,497	Gain	\$37.50	
278,548 Euclid Heights property mortgages liquidated to \$9,504.00 by a further payment		117,489.22			
3,692,000 International Mercantile Marine Co. Coll. Trust	4½	3,639,389.00	Gain	1,608,789.00	
1,905,000 International Navigation Co. First, Skg. Fd.	5	1,286,403.75	Gain	307,653.75	
67,000 New York City, Two Year Revenue	6	67,000.00			
5,500 Norfolk & Western Ry. First Consol.	4	5,218.13	Gain	213.13	
5,500 Northern Pacific Ry. Prior Lien	4	5,176.88	Gain	61.88	
56,000 Pittsburgh, Cin., Chic. & St. L. Ry.	4	53,970.00	Loss	350.00	
2,000,000 St. Louis & San Francisco R.R. Refunding	4	1,501,125.00	Loss	18,875.00	
450,000 St. L. & San. Fran. R.R. N. O. T. & M. Div. First	5	93,600.00	Loss	176,400.00	
2,000 Seaboard Air Line Ry. First	4	1,627.50	Gain	47.50	
3,000 Wabash R.R. Detroit & Chic. Extension	5	3,176.25	Loss	3.75	
4,039,000 Western Pacific Ry. First	5	1,340,443.12	Loss	1,446,466.88	
750 Woman's Hotel Co. Dividend Scrip.		750.00	Gain	150.00	
154 Shares American Shipbuilding Co. Preferred		13,773.07	Gain	683.07	
2,121 Shares Cleveland Steel Co. Capital		274,957.58	Gain	62,857.58	
619 Shares Colonial Oil Co. (acct. liq. assets)		61,900.00			
181 Shares Cumberland Pipe Line Co.		27,109.39	Gain	14,077.39	
120 Shares Delaware & Hudson R.R. Capital		17,980.20	Loss	289.80	
500 Shares Great Northern Ry. Preferred		58,018.34	Gain	4,993.34	
1,400 Shares International Agri. Corp. Common		40,706.50	Gain	33,706.50	
800 Shares International Agri. Corp. Preferred		58,343.00	Gain	34,343.00	

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500 Shares National Lead Co. Common.....	35,107.50	Gain	10,107.50
300 Shares Northern Pacific Ry. Common.....	32,991.50	Gain	5,462.75
300 Shares Ohio Fuel Supply Co. Capital.....	16,846.02	Gain	4,546.02
100 Shares Reading Company Common.....	10,322.39	Gain	2,199.06
450 Shares Swan & Finch Co. Capital.....	57,590.09	Loss	32,409.91
100 Shares Union Pacific Ry. Common.....	14,508.50	Gain	750.72
200 Shares U. S. Steel Corp. Common.....	25,296.00	Gain	12,296.00
39,150 Erie R.R. Rights.....	6,633.94		
65 Swan & Finch Co. Rights.....	209.92		
	<u>\$8,873,159.59</u>		<u>\$428,180.35</u>
2 National Transit Co., distribution of \$12.50 per share from assets reducing par, capital stock one-half.....	1,581,012.50		
3 Of refund received in adjustment of price of \$600,000.00 Anglo-French External Loan 5% bonds purchased in 1915...	982.80		
4 Euclid Heights Realty Co. bonds; amount received in further liquidation of assets.....	<u>4,790.04</u>		<u>4,790.04</u>
Total amount received for securities sold, redeemed and exchanged	<u>\$10,459,944.93</u>		
TOTAL NET GAIN ON THE ABOVE CREDITED TO RESERVE.....			<u>\$432,970.39</u>

EXHIBIT L—Continued

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS—Continued
SECURITIES GIVEN AWAY

Delivered to the General Education Board as a Gift from the Estate of
Laura S. Rockefeller Fund:

		RATE PER CENT	MARKET VALUES	
\$4,000	Atlantic Coast Line R.R. L. & N. Collateral	4	\$3,440.00	Loss
10,000	Chesapeake & Ohio Ry. Convertible	4	8,550.00	Gain
50,000	Chicago, Rock Island & Pac. Ry. Refunding	4	37,250.00	Gain
20,000	Colorado Industrial Co. First	5	15,300.00	Loss
\$2,000	Imperial Chinese Government of 1911	5	7,200.00	Loss
\$20,000	St. Louis, Iron Mt. & Sou. R.R. Un. & Ref.	4	16,200.00	Gain
25,000	U. S. Mortgage & Trust Co. First	4	24,000.00	Gain
75,000	Western Maryland R.R. First	4	54,750.00	Gain
100	Shares Baltimore & Ohio R.R. Common		9,075.00	Loss
300	Shares Consolidated Gas Co. Capital		41,700.00	Gain
36	Shares Manhattan Ry. Co. Capital		4,618.00	Gain
75	Shares Title Guarantee & Trust Co. Capital		27,500.00	Loss
			<hr/>	
			\$249,583.00	
			<hr/>	
Less cost of tax stamps				20.44
				<hr/>
NET GAIN OVER BOOK VALUES CREDITED TO RESERVE				<hr/>
				\$12,867.62
				<hr/>

EXHIBIT I.—Continued

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS—Continued

SECURITIES BOUGHT AND RECEIVED THROUGH EXCHANGE

	NAME	RATE PER CENT	COST	PRICE PER CENT
\$100,000	American Tel. & Tel. Co. 50-yr. Collateral Trust.....	5	\$97,750.00	97.75
1,000,000	Armour & Co. Real Estate First.....	4½	932,500.00	93.25
	Chehalis & Pacific Land Co. assessment of 4% on 220 shares, for taxes, etc.....		880.00	
500,000	Government of the Dominion of Canada 15-yr. Gold.....	5	472,825.00	94.56
750,000	Interborough Rapid Transit Co. First.....	5	735,000.00	98.
2,848,290	International Mercantile Marine Co. First & Collateral First..	6	2,777,032.75	97.5
250,000	Kansas City Southern Ry. First.....	3	173,437.50	69.375
180,000	New Orleans, Texas & Mex. Ry. non-cumulative income Series "A".....	5	75,600.00	42.
250,000	New York Connecting R.R. First.....	4½	245,000.00	98.
500,000	Reading & Philadelphia—Reading Coal & Iron Co. General.....	4	471,250.00	94.25
1,500,000	St. Louis & San Francisco Ry. Prior Lien.....	4	1,091,250.00	72.75
500,000	St. Louis & San Francisco Ry. Cumulative Adjustment.....	6	409,875.00	81.975
750,000	Union Pacific R.R. Refunding.....	4	675,937.50	90.125
700,000	United King. Gr. Britain & Ireland 2-yr. secured loan.....	5	696,062.50	99.4375
350,000	United King. Gr. Britain & Ireland 3-yr. Notes.....	5½	346,937.50	99.125
350,000	United King. Gr. Britain & Ireland 5-yr. Notes.....	5½	344,312.50	98.375
1,125	Shares New Orleans, Texas & Mexico Ry.....		18,000.00	16.
20,195	Shares Western Pacific R. R. Preferred.....		878,482.50	43.5
30,292½	Shares Western Pacific R. R. Common.....		461,960.62	15.25
			<u>\$10,904,143.37</u>	

EXHIBIT I—Continued

FINANCE COMMITTEE'S REPORT OF TRANSACTIONS RELATING TO INVESTED FUNDS—Continued

SECURITIES BOUGHT AND RECEIVED THROUGH EXCHANGE		RATE PER CENT		COST		PRICE PER CENT	
NAME							
7. Received from the Swan & Finch Company, rights to subscribe to new stock represented by the ownership of 65 shares.							
8. Received from the Chesebrough Manufacturing Co. 1,380 shares of stock, representing a 200% dividend on holdings of 690 shares							
9. Received from Standard Oil Company (Ohio) 8,696 shares of stock representing a 100% stock dividend on holdings of 8,696 shares.							
10. Securities received from Estate of Laura S. Rockefeller as an additional gift.							
100 Shares Baltimore & Ohio R.R. Common.....				\$9,306.94		93.0694	
120 Shares Delaware & Hudson R.R. Co., Capital.....				18,270.00		152.25	
100 Shares Reading Co. Common.....				8,123.33		81.2333	
100 Shares Union Pacific R. R. Common.....				13,757.78		137.5778	
				<hr/>			
				\$49,458.05			
				<hr/>			

EXHIBIT M

SCHEDULE OF SECURITIES IN GENERAL FUNDS ON DECEMBER 31, 1916, REPRESENTING
BOTH PRINCIPAL AND INCOME TEMPORARILY INVESTED
BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
American Agricultural Chemical Co. 1st Mtg. Conv..	5	Oct. 1928	\$500,000	101.	\$505,000.00
American Telephone & Telegraph Co. 30-yr. Collateral Trust.....	5	Dec. 1946	100,000	97.75	97,750.00
Anglo-French External Loan.....	5	Oct. 15'20	600,000	96.0862	576,517.20
Armour & Co. Real Estate 1st Mtg.....	4½	June 1939	1,000,000	93.25	932,500.00
Ashtland Power Co. 1st Mtg.....	5	Mar. 1928	8,000	100.	8,000.00
Atlantic & Birmingham Ry. 1st Mtg.....	5	Jan. 1934	677,000	90.	609,300.00
Atlantic Coast Line Ry. 1st Consolidated Mtg.....	4	July 1952	500,000	91.	455,000.00
Baltimore & Ohio R.R. Rfdg. & Gen. Mtg.....	5	Dec. 1995	650,000	99.75	648,375.00
Central Pacific Ry. 30-yr. Gtd. by So. Pac.....	3½	Aug. 1929	2,000	89.	1,780.00
Chicago & Alton R.R. Refunding Mtg.....	3	Oct. 1949	551,000	65.	358,150.00
Chicago & Alton Ry. 1st Mtg. Lien.....	3½	July 1950	854,000	53.	452,620.00
Chicago, Burlington & Quincy R.R. Gen. Mtg.....	5	Mar. 1958	1,000,000	93.5	935,000.00
Chicago City & Connecting Rys. Collateral Trust....	3	Jan. 1927	1,305,000	85.	1,109,250.00
Chicago & Eastern Ill. R.R. Rfdg. & Imp. Mtg.....	4	July 1955	300,000	63.	189,000.00
Chicago, Milwaukee & St. Paul Ry. Gen. Mtg. Ser. A.	4	May 1989	30,000	97.	29,100.00
Chicago, Milwaukee & St. Paul Ry. Gen. Mtg. Ser. C.	4½	May 1989	500,000	103.	515,000.00
Chicago, Milwaukee & St. Paul Ry. Debenture	4	July 1934	450,000	88.2838	397,277.50

EXHIBIT M—Continued
BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
Chicago, Milwaukee & St. Paul Ry. Gen. & Refdg. Ser. A.....	4½	Jan. 2014	500,000	91.0625	455,312.50
Chicago & North Western Railway Extension.....	4	Aug. 15 '26	50,000	95.	47,500.00
Chicago & North Western Railway Skg. Fund De- benture.....	5	May 1933	80,000	102.	81,600.00
Chicago Railways 1st Mtg.....	5	Feb. 1927	500,000	97.	485,000.00
Cleveland, Cin., Chic. & St. Louis Ry., St. Louis Div. Collateral Trust.....	4	Nov. 1990	73,000	90.	65,700.00
Cleveland, Cincinnati, Chicago & St. Louis Ry. Gen. Mtg.....	4	June 1993	700,000	83.893	587,250.00
Cleveland Short Line 1st Mtg. Gtd. L. S. & M. S.....	4½	April 1961	500,000	95.	475,000.00
Colorado Industrial Co. 1st Mtg.....	5	Aug. 1934	2,000,000	80.	1,600,000.00
Consolidated Gas Co. of N. Y. Conv. Debenture.....	6	Feb. 1920	500,000	110.	550,000.00
Denver & Rio Grande R.R. 1st Consolidated Mtg.....	4	Jan. 1936	6,000	85.	5,100.00
Dominion of Canada, Gov't of, 15-yr.....	5	April 1931	500,000	94.565	472,825.00
Erie Railroad, Conv. Series B.....	4	April 1953	1,065,000	74.7175	795,742.30
Euclid Heights Realty Co. Cleve. Trust Co. participa- tion certificates in certain mortgages on property formerly owned by, Participation Ctf. No. 1.....	6		202,400	Liq. to	2,222.93
Participation Ctf. No. 3.....	6		76,148	Liq. to	7,281.07
Illinois Central R.R. Refunding Mtg.....	4	Nov. 1955	300,000	87.	261,000.00
Interborough Rapid Transit Co. 1st Mtg.....	5	Jan. 1966	1,750,000	96.8571	1,695,000.00

International Mercantile Marine Co. 1st & Collateral Trust Skg. Fund.....	6	Oct. 1941	2,848,290	97.5	2,777,082.75
Kansas City Southern Ry. 1st Mtg.....	3	April 1950	250,000	69.375	173,437.50
Lake Erie & Western R.R. 2nd Mtg.....	5	July 1941	100,000	100.	100,000.00
Lake Shore & Mich. So. Ry. 1st Mtg.....	3½	June 1997	926,000	87.	805,620.00
Lake Shore & Mich. So. Ry. Debenture.....	4	Sept. 1928	762,000	92.	701,040.00
Lake Shore & Mich. So. Ry. Debenture.....	4	May 1931	2,673,000	92.	2,459,160.00
Long Island R.R. Refunding Mtg.....	4	Mar. 1949	2,000	90.	1,800.00
Louisville & Nashville R.R. Unifying.....	4	July 1940	6,000	93.	5,580.00
Magnolia Petroleum Company 1st Mtg.....	6	Jan. 1937	3,140,000	100.	3,140,000.00
Missouri, Kansas & Texas Ry. Gen. Skg. Fund.....	4½	Jan. 1936	1,325,000	84.	1,113,000.00
Missouri, Pacific Ry. 40-year Collateral Trust.....	4	Mar. 1945	2,198,000	60.	1,318,800.00
Morris & Essex R.R. 1st Mtg. & Refunding.....	3½	Dec. 2000	175,000	82.75	144,812.50
Mutual Fuel Gas Co. 1st Mtg.....	5	Nov. 1947	250,000	100.	250,000.00
National Railways of Mexico, Skg. Fund with Jan. 1915 and subsequent coupons attached...	4½	July 1957	50,000	59.	29,500.00
National Railways of Mexico, Secured 6% Notes for coupon due January 1, 1914.....	..	Jan. 1917	1,125	59.	663.75
National Railways of Mexico, Guaranty Trust Co. Receipt for July 1, 1914 coupon.....	..	.....	1,125	59.	663.75
New Orleans, Texas & Mexico Ry. Non Cumulative Income Series A.....	5	Oct. 1935	180,000	42.	75,600.00
N Y. Central Lines Equipment Trust of 1913.....	4½	46M ea. yr. Jan. 17-'28	432,000	99.039	427,849.81
N. Y. Central & H. R.R. R.30-year Debenture.....	4	May 1934	330,000	88.45	291,885.00
New York, Chicago & St. Louis R.R. 1st Mtg.....	4	Oct. 1937	35,000	95.	33,250.00
New York, Chicago & St. Louis R.R. Debenture.....	4	May 1931	1,303,000	87.	1,133,610.00
New York City Corporate Stock.....	4½	Mar. 1964	100,000	94.5	94,500.00
New York City 3-year Revenue Bonds.....	6	Sept. 1917	94,000	100.	94,000.00
New York Connecting R.R. 1st Mtg.....	4½	Aug. 1953	500,000	95.69073	478,453.65

EXHIBIT M—Continued
BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE
Northern Pacific Ry. General Lien.....	3	Jan. 2047	250,000	65.	162,500.00
Northern Pacific Ry. Refunding & Imp. Mtg.....	4½	July 2047	390,000	91.5769	357,150.00
Ohio Fuel Supply Co. Debenture.....	6	Mar. 1927	51,925	100.	51,925.00
Pennsylvania R.R. Consolidated Mtg.....	4	May 1943	£2,400	99.	11,880.00
Pennsylvania R.R. General Mtg.....	4½	June 1965	\$1,500,000	98.25	1,473,750.00
Pere Marquette R.R. Consolidated Mtg.....	4	Jan. 1951	520,000	63.	327,600.00
Philadelphia Co. Convertible Debenture.....	5	May 1922	1,000,000	97.	970,000.00
Philadelphia Co. Convertible Debenture.....	5	Aug. 1919	500,000	95.	475,000.00
Pittsburgh, Cin., Chic. & St. L. Ry. Consolidated Ser. I	4½	Aug. 1963	500,000	103.	515,000.00
Province of Quebec, 5 year.....	5	April 1920	500,000	99.75	498,750.00
Reading Co.-Phila. & Reading Coal & Iron Co. General	4	Jan. 1997	500,000	94.25	471,250.00
Rutland R.R. 1st Consolidated Mtg.....	4½	July 1941	25,000	90.	22,500.00
St. Louis & San Francisco Ry. Prior Lien Series A....	4	July 1950	1,500,000	72.75	1,091,250.00
St. Louis & San Francisco Ry. Adjustment Mtg.....	6	July 1955	500,000	81.975	409,875.00
Seaboard Air Line Ry. Adjustment Mtg.....	5	Oct. 1949	455,000	77.	350,350.00
Southern Pacific Branch Ry. 1st Mtg.....	6	April 1937	100,000	117.1402	117,140.20
Southern Pacific R.R. 1st Refunding Mtg.....	4	Jan. 1955	100,000	86.	86,000.00
Sunday Creek Co. Collateral Trust.....	5	July 1944	81,000	78.	63,180.00
Union Pacific R.R. Refunding Mtg.....	4	Jan. 2008	1,000,000	90.125	901,250.00
United King. of Gr. Brit. & Ire. 2-yr. Secured Loan...	5	Sept. 1918	700,000	99.4375	696,062.50
United King. of Gr. Brit. & Ire. 3-yr. Notes.....	5½	Nov. 1919	350,000	99.125	346,937.50
United King. of Gr. Brit. & Ire. 5-yr. Notes.....	5½	Nov. 1921	350,000	98.375	344,312.50

Wabash R.R. Omaha Div. 1st Mtg.....	3½	Oct. 1941	45,000	65.	29,250.00
Wabash R.R. 2nd Mtg.....	5	Feb. 1939	120,000	97.8	117,360.00
Washington Ry. & Elec. Co. Consolidated Mtg.....	4	Dec. 1951	450,000	83.5	375,750.00
Western Maryland Ry. 1st Mtg.....	4	Oct. 1952	1,032,000	78.8913	814,158.76
Wheeling & Lake E. R.R. L. E. Div. 1st Mtg.....	5	Oct. 1926	140,000	100.	140,000.00
Wheeling & Lake E. R.R. 1st Consolidated Mtg.....	4	Mar. 1949	434,000	80.	347,200.00
TOTAL BONDS.....					\$42,623,843.67

STOCKS

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
OIL COMPANY STOCKS:				
Borne-Scrymser Company.....	20	350	295.	\$103,250.00
Buckeye Pipe Line Company (par \$50).....	16	49,693	160.	7,950,880.00
Chesebrough Manufacturing Company Consolidated.....	14	2,070	223.3333	462,300.00
The Colonial Oil Company 100 % paid % dissolution.....	..	619	.....	.....
The Continental Oil Company.....	12	7,000	190.	1,330,000.00
Crescent Pipe Line Company (par \$50).....	6	14,120	60.	847,200.00
Cumberland Pipe Line Company.....	5	2,300	72.	165,600.00
Eureka Pipe Line Company.....	2½	12,357	361.332	4,464,995.59
Galena-Signal Oil Company Preferred.....	8	4,193	140.	587,024.13
Galena-Signal Oil Company Common.....	12	20,842	190.	3,959,976.12
Indiana Pipe Line Company (par \$50).....	16	24,845	125.111	3,108,385.28
National Transit Company (par \$12.50).....	4	126,481	28.5	3,604,708.50
New York Transit Company.....	16	12,392	300.	3,717,600.00

EXHIBIT M—Continued
STOCKS

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
OIL COMPANY STOCKS:				
Northern Pipe Line Company	10	9,000	110.	990,000.00
Solar Refining Company	10	4,964	185.007	918,375.00
South West Pa. Pipe Lines	12	8,000	160.	1,280,000.00
Southern Pipe Line Company	24	24,845	229.5556	5,703,308.88
Standard Oil Company (Kansas)	12	4,966	275.0167	1,365,733.13
Standard Oil Company (Kentucky)	20	7,434	140.5094	1,044,547.23
Standard Oil Company (Nebraska)	20	2,482	270.	670,140.00
Standard Oil Company (Ohio)	15	17,392	210.	3,652,320.00
Swan & Finch Company	..	65	196.78	12,790.78
Union Tank Line Company	5	24,105	70.	1,687,350.00
Washington Oil Company (par \$10)	40	1,774	30.	53,220.00
TOTAL OIL COMPANY STOCKS				\$47,679,704.64
MISCELLANEOUS STOCKS:				
American Shipbuilding Company Preferred	7	9,303	85.	\$790,755.00
American Shipbuilding Company Common	..	14,972	35.	524,020.00
Atchison, Topeka & Santa Fe Ry. Preferred	5	5,900	98.25	491,250.00
Atchison, Topeka & Santa Fe Ry. Common	6	21,100	95.2563	2,009,908.33
Central National Bank of Cleveland	8	500	159.2222	79,611.10
Chehalis & Pacific Land Company	..	220	49.4545	10,880.00
Chicago City & Connecting Ry. Preferred Participation Certificates	4½	17,530	69.1875	1,212,856.88

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Chicago City & Connecting Ry. Common Participation Certificates					
Cleveland Arcade Company	8	10,518	30.	315,540.00	
Cleveland Trust Company	10	2,500	98.6222	246,555.56	
Colorado & Southern Ry. 1st Preferred	4	286	238.195	68,123.77	
Consolidated Gas Company of N. Y.	6	7,000	54.	378,000.00	
Wm. Cramp & Sons, Ship & Engine Building Company		20,000	127.50	2,550,000.00	
Erie Railroad 1st Preferred		648	15.	9,720.00	
Great Lakes Towing Company Preferred	7	21,400	45.8305	980,773.76	
Great Lakes Towing Company Common		1,527	88.7361	135,500.05	
International Agricultural Corporation Preferred		1,200	12.	14,400.00	
International Agricultural Corporation Common		6,545	30.	196,350.00	
H. H. Kohlsaat Company		8,175	5.	40,875.00	
Manhattan Railway	7	1,900	50.	95,000.00	
National Fuel Gas Company	10	10,000	128.775	1,287,750.00	
National Lead Company Preferred	7	138	202.913	28,002.50	
National Lead Company Common	4	1,400	104.	145,600.00	
New Orleans, Texas & Mexico Ry.		29,400	50.	1,470,000.00	
New York, Chicago & St. Louis R.R. 2nd Preferred	4	1,125	16.	18,000.00	
New York, Chicago & St. Louis R.R. Common		400	78.70	31,480.00	
Northern Pacific Ry.	7	100	55.	5,500.00	
Ohio Fuel Supply Company (par \$25)	8	700	91.7625	64,233.75	
Otis Steel Company Preferred	7	4,054	40.9301	165,930.67	
Otis Steel Company Common		140	90.	12,600.00	
Pressed Steel Car Company Preferred	7	329	20.	6,580.00	
Provident Loan Certificates (par \$5,000)	6	500	89.75	44,875.00	
Seaboard Air Line Ry. Preferred		40	100.	200,000.00	
Seaboard Air Line Ry. Common		4,300	54.	232,200.00	
Sheffield Farms-Slawson Decker Company Preferred	6	3,400	21.	71,400.00	
Superior Savings & Trust Company	12	150	99.4	14,910.00	
		300	297.6333	89,350.00	

EXHIBIT M—Continued
STOCKS

NAME	RATE %	NUMBER OF SHARES	PRICE %	CASH PRICE
MISCELLANEOUS STOCKS:				
Tilden Iron Mining Company.....	..	1,780	27.35	48,683.46
U. S. Cast Iron Pipe & Foundry Company Preferred.....	2	1,987	44.444	88,310.89
U. S. Rubber Company 1st Preferred.....	8	300	101.2313	30,369.40
Western Maryland Ry. Preferred.....	..	500	46.	23,000.00
Western Pacific R.R. Corporation Preferred.....	..	20,195	43.5	878,482.50
Western Pacific R.R. Corporation Common.....	..	30,292½	15.25	461,960.62
Wilson Realty Company.....	..	591	100.	59,100.00
Woman's Hotel Company.....	5	300	80.	24,000.00
TOTAL MISCELLANEOUS STOCKS.....				\$15,652,438.24
TOTAL SECURITIES BELONGING TO GENERAL FUNDS PRINCIPAL AND INCOME ACCOUNTS.....				
				\$105,955,986.55
NOTE—The securities representing Special Funds, Exhibit N, are not included in the above.				
NOTE—All securities are valued at the price at which they were purchased or at the value assigned to them when they were donated, interest and dividends accrued at the date of purchase or donation being allowed for.				
NOTE—The foregoing investments are apportioned as follows:				
General Fund.....				\$100,000,000.00
General Fund Income.....				4,007,838.76
Estate Laura S. Rockefeller Fund.....				177,733.00
Reserve.....				1,770,414.79
TOTAL.....				\$105,955,986.55

EXHIBIT N
SCHEDULE OF SECURITIES HELD IN SPECIAL FUNDS DECEMBER 31, 1916
JOHN D. ROCKEFELLER FUND
BONDS

NAME	RATE %	DATE OF MATURITY	AMOUNT	PRICE %	CASH PRICE	YIELD
Canada Southern Ry. Consol. "A"	5	Oct. 1962	\$37,000	100.	\$37,000.00	6.
TOTAL BONDS					\$37,000.00	

LAURA S. ROCKEFELLER FUNDS
BONDS

Colorado Industrial Co. First.	5	Aug. 1934	\$50,000	80.	\$40,000.00	6.95
Virginia Carolina Chem. Co. First.	5	Dec. 1923	10,000	93.	9,300.00	6.18
TOTAL BONDS					\$49,300.00	



APPENDIX



APPENDIX I

CONSTITUTION OF THE ROCKEFELLER FOUNDATION¹

ARTICLE I

Members

The members of the Corporation shall consist of the persons named in the first section of the Act to incorporate The Rockefeller Foundation, being Chapter 488 of the laws of 1913 of the State of New York, *viz.*: John D. Rockefeller, John D. Rockefeller, Junior, Frederick T. Gates, Harry Pratt Judson, Simon Flexner, Starr J. Murphy, Jerome D. Greene, Wickliffe Rose, and Charles O. Heydt, together with such persons as they may associate with themselves, and their successors.

New members, whether as successors to those named in the Act of Incorporation or otherwise, and such additional members as they or their successors shall see fit to associate with them, shall be elected by ballot, either at the annual meeting of the Corporation or at a special meeting duly called for that purpose, by vote of a majority of the members of the Corporation attending such meeting.

Any member may withdraw from the Corporation by a notice in writing to the President or Secretary. The members shall be at all times divided into three classes, equal numerically, as nearly as may be, and the original members shall at their first meeting, or as soon thereafter as may be convenient, be divided into three classes, the members of the first class to hold their membership and office until the first annual meeting, the members of the second class until the second annual meeting, and the members of the third class until the third annual meeting, and

¹The amendments to the Constitution which have been adopted during 1916 are shown in italics.

in every case the member shall hold office after the expiration of his term until his successor shall be chosen. At each annual meeting the successors to those members whose terms of office then expire shall be chosen for the term of three years and until their successors shall be chosen. In case any member shall by death, resignation, incapacity to act, or otherwise, cease to be a member during his term, his successor shall be chosen to serve for the remainder of his term and until his successor shall be chosen. If and when the number of members shall be less than nine, the members remaining shall have power to add, and shall add to their number, until the number shall be not less than nine, but no act of the Corporation shall be void because at the time such act shall be done the members of the Corporation shall be less than nine.

All the powers of the Corporation shall be exercised by its members, and they may, by general resolution, subject to the provisions of this Constitution and the By-Laws to be adopted, delegate to other officers or to committees of their own number such powers as they may see fit, in addition to the powers specified in this Constitution and in such By-Laws.

ARTICLE II

Quorum

A majority of the members of the Corporation shall constitute a quorum for the transaction of business at meetings of the Corporation.

ARTICLE III

Trustees

The number of trustees by whom the business and affairs of the Corporation shall be managed shall be the same as the number of members, and all of the members of the Corporation shall be its trustees, and the election of any person as a member of the Corporation shall constitute him a trustee.

ARTICLE IV

Officers

The officers of the Corporation shall consist of a President, Secretary, Treasurer and *Comptroller*, together with such other officers as may be determined by the By-Laws. These officers shall have the duties and exercise the powers assigned to them by this Constitution or by the By-Laws, or by resolutions adopted pursuant to the authority of this Constitution or the By-Laws. At each annual meeting of the Corporation or, in default of election at such meeting, then at an adjournment thereof, or at any meeting duly called for that purpose, the Corporation shall elect by ballot a President, Secretary, Treasurer and *Comptroller*, and it may choose such other officers as the By-Laws shall from time to time provide. All the officers, whether elected or appointed, shall hold office at the pleasure of the Corporation, but in no case beyond the time when their respective successors shall be elected and accept office.

ARTICLE V

President

The President shall sustain an executive and advisory relation to the work and policies of the Corporation similar to that usually sustained by the chairman or president of commercial bodies. He shall preside at all meetings of the Corporation at which he shall be present. He shall appoint all committees unless otherwise ordered by the Corporation. In his absence, the members of the Corporation present shall appoint one of their own number to preside. The President, ex-officio, shall be a member of all committees, except as herein otherwise provided. He shall sign for the Corporation all deeds and other agreements and formal instruments.

In the absence or disability of the President he may by written instrument appoint a member of the Corporation

to discharge such of his functions as he may assign to such appointee.

ARTICLE VI

Treasurer

The Treasurer, subject to such regulations as may from time to time be prescribed by the Corporation, shall have the custody of the funds and securities of the Corporation, including all bonds, deeds and other papers and documents relating to such property, and shall also have the disbursement of its money. He shall keep *proper records of securities and other evidences of property belonging to the Corporation, and also proper books of account, and other books, showing at all times the amount of funds belonging to the Corporation, which shall be at all times open to the inspection of the members of the Corporation.* At each meeting he shall present an account showing in detail the receipts of the property belonging to the Corporation and of all disbursements thereof since his last report. He shall not pay any money except in the manner prescribed in the By-Laws, or as provided by resolution of the members of the Corporation, or the authority of the Executive Committee.

ARTICLE VII

Comptroller

The Comptroller shall keep proper records of all appropriations, budgets, and other authorizations of expenditure, and shall maintain duly itemized and classified accounts of expenditures made in pursuance thereof. He shall also keep a duplicate record of the securities and other evidences of property belonging to the Corporation as recorded in the office of the Treasurer.

ARTICLE VIII

Secretary

The Secretary shall conduct the correspondence of the Corporation except as otherwise provided in the By-Laws.

or by resolution of the Corporation. He shall be the medium of communication with the Corporation. He shall be ex-officio a member of all committees except as herein otherwise provided.

He shall give notice of and attend all meetings of the Corporation, taking minutes of the proceedings and transcribing them in a book provided for that purpose, and attesting the same. Immediately upon the election and appointment of members he shall give notice to them of their election or appointment. He shall have the custody of the corporate seal. He shall keep the records of all committees of which he is a member.

ARTICLE IX

Meetings

The annual meeting of the Corporation shall be held on the Wednesday next preceding the fourth Thursday of January in each year. At this meeting the Trustees of the Corporation shall present a report, verified by the President and Treasurer, or by a majority of the Trustees, showing the whole amount of real and personal property owned by the Corporation, where located, and where and how invested, the amount and nature of the property acquired during the year immediately preceding the date of the report, and the manner of the acquisition; the amount applied, appropriated or expended during the year immediately preceding such date, and the purposes, objects or persons to and for which such applications, appropriations or expenditures have been made, and the names and places of residence of the persons who have been admitted to membership in the Corporation during such year, which report shall be filed with the records of the Corporation and an abstract thereof entered in the minutes of the proceedings of the annual meeting.

In addition to the annual meeting, stated meetings of the Corporation shall be held on the Wednesday next preceding the fourth Thursday of May and October in each year.

All meetings shall be held at such time and place in the City of New York, or elsewhere, as the Corporation shall from time to time order or direct. In the absence of such direction, the meetings shall be held at the office of the Corporation in the City of New York.

The President or any three members of the Corporation may call a special meeting of the Corporation by not less than five days' written notice given by the President or the Secretary, or the members calling such meeting.

If any member of the Corporation, other than Mr. John D. Rockefeller, shall be absent from three consecutive stated meetings, such absence, unexcused, shall *ipso facto* be deemed a resignation of membership of the Corporation, and the vacancy so caused shall be filled as herein provided. Any member of the Corporation may by writing or telegram appoint any other member of the Corporation to act as his proxy at any one or more specified meetings of the Corporation.

ARTICLE X

Committees

The Corporation may by By-Laws provide for such committees and may delegate to such committees such power as it shall deem wise.

ARTICLE XI

Amendments

This Constitution may be altered or amended by a majority vote of the members present at any duly called meeting of the Corporation, provided that written notice has been sent to every member of the Corporation at least ten days in advance of the date of meeting, stating specifically the proposed amendment.

BY-LAWS OF THE ROCKEFELLER FOUNDATION¹

ARTICLE I

There shall be a standing committee of three members of the Corporation who with the President and Secretary shall be the Executive Committee. The Executive Committee shall be elected by the Corporation at the annual meeting by ballot. The Executive Committee may fill vacancies in its own number or in the Finance Committee in the interim of the Corporation meetings, reporting its action to the Corporation at the next meeting.

This Committee shall have and may exercise all the powers of the Corporation when the Corporation is not in session, except those specifically vested in the Finance Committee as herein provided. A quorum for the transaction of business shall consist of three members. The Committee shall elect its Chairman and shall make such rules and regulations as, from time to time, it may deem proper for its own government and for the transaction of business of which it may have charge, which are not herewith otherwise provided for. It shall direct and control the purchase of all supplies and the audit of all bills.

ARTICLE II

There shall be a Finance Committee consisting of three members of the Corporation, to be elected by the Corporation at the annual meeting by ballot. The President and Secretary shall not be ex-officio members of this Committee. This Committee shall have power to make investments and to change the same, and may from time to time sell any part of the bonds, shares, notes or other forms of investment held by the Corporation, or any rights or privileges that may accrue thereon. *The Committee shall have authority in its discretion in so far as may be proper for*

¹ The amendments to the By-Laws which have been adopted during 1916 are shown in italics.

the safeguarding of the investments of the Foundation to participate in the reorganization of any corporation which is insolvent or is in financial difficulty, the securities of which are held by this Corporation, and to deposit any securities held by this Corporation with such protective or reorganization committees and on such terms as the Finance Committee may deem proper. In making investments or changes of investments, all the members of this Committee shall be consulted when this is reasonably practicable, but the Committee shall be deemed to be in continuous session, and may act without formal notice of meeting, and the joint action of any two members shall be valid and binding. The Committee shall elect its Chairman and shall make such rules and regulations as from time to time it may deem proper for its own government and for the transaction of business of which it may have charge. It shall keep regular minutes of its meetings and shall make report to the members of the Corporation of all investments and changes of investments made by it.

ARTICLE III

There shall be a Nominating Committee consisting of three members of the Corporation, to be elected by the Corporation each year at the October meeting by ballot. The President and the Secretary shall not be ex-officio members of this Committee. It shall be the duty of this Committee to make recommendations regarding members, officers and elective committees who are to be elected at the annual meeting next ensuing, and also regarding members or officers to be chosen to fill vacancies which may occur during the year.

ARTICLE IV

The Corporation at any stated meeting, or at any special meeting called for that purpose or when the Corporation is not in session, the Executive Committee, may by

resolution appoint one or more assistant treasurers, one or more assistant secretaries, a cashier, and such other officers as may be deemed necessary. The same person may be appointed to hold two or more of said offices. All such officers shall hold office at the pleasure of the Corporation, but in no case beyond the time when their respective successors shall be elected and accept office, and shall have such powers and be subject to such restrictions as shall be set forth in the resolution appointing them.

ARTICLE V

The Treasurer shall deposit the funds of the Corporation in such banks or trust companies as may from time to time be designated by the Executive Committee. Such deposits of funds shall be made subject to draft only on the signatures of any two of the following officers: President, Treasurer, Assistant Treasurer, and such member of the Corporation as the President shall designate in writing for that purpose. A current expense account of not to exceed Five thousand dollars (\$5,000) on deposit at any one time may be opened with such depository as may be designated by the Executive Committee, which shall be subject to draft upon the signature of the Cashier of the Corporation, who shall be bonded at the expense of the Corporation for such sum as the Executive Committee shall fix.

No bills shall be paid except those which have been incurred pursuant to a resolution of the Corporation or under the authority of the Executive Committee, and such bills shall be paid only on a voucher approving the same for payment and referring to the specific resolution or authorization pursuant to which they were respectively incurred, which voucher shall be signed by the Secretary or by such of the Assistant Secretaries as shall be designated by resolution of the Corporation or the Executive Committee, *and shall be certified by the Comptroller as not exceeding the funds available under such resolution or authorization.*

The Treasurer and Assistant Treasurer shall be bonded at the expense of the Corporation for such sums as the Executive Committee shall fix.

The securities of the Corporation shall be deposited in some suitable deposit vault or vaults designated by the Executive Committee. Access to the securities may be had and they may be withdrawn by the Treasurer or Assistant Treasurer accompanied by the Comptroller or by such representative of the Comptroller as may from time to time be designated by the Executive Committee. In case of the absence or incapacity of both the Treasurer and the Assistant Treasurer, the Executive Committee may by resolution name a person to act in place of the Treasurer. The Executive Committee may also by resolution authorize any two members of the Corporation to have access to the securities for the purpose of audit or such other purpose as it may specify in the resolution.

ARTICLE VI

Any two of the following persons, viz.: President, Secretary, Treasurer and Assistant Treasurer and members of the Finance Committee shall have authority to execute under seal such form of transfer and assignment as may be customary or necessary to constitute a regular transfer of any stocks or other registered securities standing in the Corporation's name. And a corporation transferring any such stocks, or other registered securities pursuant to a form of transfer or assignment so executed shall be fully protected and shall be under no duty to inquire whether or not the Finance Committee has taken action in respect thereof.

Either the President or the Treasurer may execute and deliver on behalf of the Corporation from time to time proxies on any and all stock owned by the Corporation, appointing such person or persons as they shall deem proper to represent and vote the stock owned by the Corporation at any and all meetings of stockholders, whether general or special, with full power of substitution,

and to alter and rescind such appointments at such time and as often as they see fit.

ARTICLE VII

Notices

All notices required by these By-Laws, or otherwise, for the purpose of the Corporation, shall be in writing and shall be either personally delivered or mailed to the members of the Corporation at their addresses as entered in the office of the Secretary of the Corporation.

ARTICLE VIII

No part of the principal of the funds of the Foundation shall be distributed except pursuant to a resolution, passed by the affirmative vote of two-thirds of all those who shall at the time be members of the Foundation at a special meeting held on not less than thirty days' notice given in writing to each member of the Foundation which shall state that the meeting is called for the purpose of considering a resolution to authorize the distribution of the whole or some part of the principal of its funds.

ARTICLE IX

Amendments

These articles may be altered or amended by a majority vote of the members present at any duly called meeting of the Corporation, provided that written notice has been sent to every member of the Corporation at least ten (10) days in advance of the date of meeting, stating specifically the proposed amendment.

APPENDIX II

RULES OF THE INTERNATIONAL HEALTH BOARD

SECTION 1. *Membership.* The International Health Board shall consist of the Executive Committee of the Rockefeller Foundation and the additional members heretofore or hereafter elected, and their successors.

SECTION 2. *Election of Members.* The additional members mentioned in the foregoing section shall be elected by the Rockefeller Foundation at its annual meeting to serve for a period of three years from the date of their election and until their successors shall have been elected. They shall be divided as nearly as may be into three equal classes, one class being elected each year. The Rockefeller Foundation or its Executive Committee may fill vacancies in the membership of the Board occurring between the annual meetings of the Foundation, but a member elected to fill a vacancy shall serve only for the remainder of the term of his predecessor.

SECTION 3. *President and Secretary.* The President and Secretary of the Rockefeller Foundation shall be respectively the Chairman and the Secretary of the International Health Board.

SECTION 4. *Director General.* The Director General shall be the chief executive officer of the International Health Board. It shall be his duty to direct and supervise the work of the Board, to nominate other administrative or medical officers, and to conduct the correspondence of the Board. He shall prepare and present the business to be acted upon at meetings of the Board or its Executive Committee, and execute the decisions thereof.

SECTION 5. *Assistant Director General.* The Assistant Director General shall act as the assistant and repre-

sentative of the Director General, and shall perform such duties as the latter shall assign to him. In the absence or incapacity of the Director General, the Assistant Director General shall assume the duties of the Director General.

SECTION 6. *Other Officers.* The more immediate administration, direction, and supervision of work in the field shall be committed to Directors entitled and ranking as follows:

1. Regional Directors.
2. Senior State Directors.
3. State Directors.
4. Junior State Directors.
5. Field Directors.
6. Junior Field Directors.

These officers shall be nominated by the Director General and appointed by the Board or the Executive Committee. Other officers may be similarly nominated and appointed at the discretion of the Board.

SECTION 7. *Authorization of Work and Expenditures.* All the operations of the Board and of its officers shall be in accordance with plans submitted by the Director General and duly approved by the Board, and all expenses or liabilities incurred thereunder shall be in conformity with approved budgets or other authorizations by the Board, and with the By-Laws of the Rockefeller Foundation.

SECTION 8. *Expenditures Subject to Appropriation of Rockefeller Foundation.* All authorizations of expenditures by the Board or its agents shall be subject to the appropriation of sufficient funds by the Rockefeller Foundation.

SECTION 9. *Disbursements and Accounts.* All disbursements of the Board shall be made, and all records and accounts pertaining thereto, shall be kept by the disbursing and accounting officers of the Rockefeller Foundation.

SECTION 10. *Regulations of the Board.* The Board shall be authorized to make such additional regulations for the

conduct of its affairs as it may find expedient provided such regulations are not inconsistent with these Rules or with the Constitution and By-Laws of the Rockefeller Foundation.

SECTION 11. *Amendments.* These Rules may be amended by resolution of the Foundation at any meeting duly called provided a notice stating specifically the proposed amendment be sent to each member of the Foundation at least ten days before the meeting.

APPENDIX III

INSTRUCTIONS TO MEMBERS AND EMPLOYEES OF THE WAR RELIEF COMMISSION OF THE ROCKEFELLER FOUNDATION¹

1. The objects of the War Relief Commission of the Rockefeller Foundation are to advise the Foundation in regard to the needs of non-combatants and the measures to be taken for their relief, and to execute or supervise such measures of relief as may be duly authorized by the Foundation and approved by the appropriate civil and military authorities.

2. Members and employes of the War Relief Commission who are sent to the countries at war or to neighboring countries are required to devote themselves exclusively to the objects of their mission.

3. Members and employes of the War Relief Commission are required to observe strict neutrality in word and act, to refrain from expressions of opinion on the issues of the war, and to preserve in the strictest confidence any knowledge as to facts of actual or potential military significance of which the correct performance of their purely neutral functions may make them cognizant. With a view to the faithful observance of this regulation, habitual reticence as to events and conditions in the belligerent countries is enjoined.

4. Owing to the restrictions necessarily placed upon travel in and between the belligerent countries, members and employes of the War Relief Commission are cautioned to show respect to officials charged with the duty of examining travelers and to submit with equanimity to

¹ Adopted by the Executive Committee of the Rockefeller Foundation, March 14, 1916.

such detention as may be required for this purpose. In case the credentials exhibited should be deemed unsatisfactory or insufficient, an opportunity for communication with the appropriate Embassy, Legation or Consulate of the United States should be requested.

APPENDIX IV

LETTERS OF GIFT¹

January 19, 1916.

The Rockefeller Foundation,
61 Broadway, New York City.

Gentlemen:

The executors of the will of the late Laura S. Rockefeller, exercising the power vested in them under the will to distribute the residuary estate to such charitable corporations as they may select, and in such sums as they may deem proper, hand you herewith the following securities, in addition to those delivered to you under date of September 30, 1915:

120 shares Delaware & Hudson Railroad stock, at 153.....	\$18,360
100 Reading Railroad common stock, at 82....	8,200
100 shares Union Pacific Railroad common stock, at 138.....	13,800
100 Baltimore & Ohio Railroad common, at 95	9,500
Total.....	<hr/> \$49,860

Kindly sign and return the enclosed receipt.

Very truly,

(Signed) JOHN D. ROCKEFELLER, JR.,

Executor.

26 Broadway, New York,
September 29, 1916.

The Rockefeller Foundation,
61 Broadway, New York City.

Gentlemen:

By the letter of Mr. John D. Rockefeller, Jr., January 26, 1916, you were advised that the executors of Laura S. Rockefeller, in exercise of the discretion vested in them by

¹ For previous Letters of Gift see Annual Reports for 1913-14 and 1915.

her will to apply her residuary estate to such charitable corporations as they might select, selected the Rockefeller Foundation to be the recipient of the residue of the estate after making provision for certain other charitable corporations.

Pending the adjudication of the question whether the legacies to charitable corporations are taxable under the transfer tax law, the executors have reserved a portion of the estate to cover that point. The question has now been passed upon by the Transfer Tax Appraiser, and on appeal from his decision by the Surrogate, both of whom have held that the legacies are not taxable. The State Comptroller still has the right of appeal from the decision of the Surrogate, but the executors are of opinion that it is highly probable that if the appeal is taken the decision of the Surrogate will be sustained.

As the Foundation is entitled to whatever residue there may be, the effect of a decision that the legacies are taxable would simply be to reduce the amount which the Foundation would receive. In view of the probability that the tax will not be imposed, the executors are willing now to pay over to the Foundation \$37,000 of the cash balance in their hands, with the understanding that if it is finally adjudicated that the estate is taxable or that in any other way the executors are subjected to liability by reason of paying over this money, the Foundation will to the extent of this payment hold them harmless, and will either discharge such liabilities itself or reimburse them for any sums that they may have been obliged to pay.

Upon receipt of advices that this suggestion is approved by you we shall be happy to make the payment at once.

(Signed) Very truly yours,

ESTATE OF LAURA S. ROCKEFELLER,

By JOHN D. ROCKEFELLER,

per STARR J. MURPHY,

Attorney and Counsel.

APPENDIX V

The following report, prepared by Dr. William H. Welch and Mr. Wickliffe Rose, was presented to the Trustees at their meeting in January, 1916.

January 12, 1916.

INSTITUTE OF HYGIENE

At a conference¹ on training for public health service held at the offices of the General Education Board in New York on October 16, 1914, discussion seemed to develop substantial agreement on the following points: (1) that a fundamental need in the public health service in this country at the present time is of men adequately trained for the work; (2) that a distinct contribution toward meeting this need could be made by establishing at some convenient place a school of public health of high standard; (3) that such an institution, while maintaining its separate identity, should in the interest both of economy and of efficiency be closely affiliated with a university and its medical school; (4) that the nucleus of this school of public health should be an institute of hygiene.

Mr. Rose and Dr. Welch were asked to formulate a plan for such an institute of hygiene and in compliance with this request offer the following report, which is designed to set forth the scope and general character of organization of the institute and the service which it should render in training in hygiene, preventive medicine and public health and in the advancement of these subjects. If desired, the

¹Dr. A. C. Abbott, Dr. Hermann M. Biggs, Dr. Simon Flexner, Mr. Jerome D. Greene, Dr. Victor G. Heiser, Dr. Edwin O. Jordan, Mr. Starr J. Murphy, Dr. Wm. H. Park, Mr. Wickliffe Rose, Dr. M. J. Rosenau, Dr. Theobald Smith, Dr. George C. Whipple, Dr. C. E. A. Winslow, Dr. Wm. H. Welch, Prof. D. D. Jackson, Dr. F. Cleveland, Dr. Wallace Buttrick, Dr. E. C. Sage and Dr. Abraham Flexner.

report can be supplemented by a detailed statement of organization, plan of building, budget and courses of instruction.

I. PUBLIC HEALTH AND HYGIENE IN ENGLAND AND IN GERMANY

The origins of the modern public health movement and of the cultivation of hygiene as an independent science may be found especially in the passage of the Public Health Act in England in 1848 and in the establishment of the first hygienic institute by von Pettenkofer in Munich in 1865. The greatest stimulus to further development came from the discoveries relating to the causation and mode of spread of the infectious diseases and the consequent vastly increased power to control these diseases. It is instructive for the present purpose to note the different conceptions and directions of development in this field in the two countries. In Germany every university has its department or institute of hygiene, conducted by a professor and corps of assistants, where the subject is represented broadly in all its varied aspects, students are taught by lectures, laboratory courses and field work, and the science is advanced by research. In England, on the other hand, the important hygienic laboratories are few and mostly governmental or independent. For training the emphasis is laid upon public health administration, in which respect Great Britain leads the world. Those desiring to qualify as medical officers of health must possess the diploma in public health, obtained by passing an examination after at least nine months of special preparation, most frequently under a qualified medical officer of health and in a hospital for infectious diseases. It seems obvious that lessons are to be learned from both the German and the English systems, and that the ideal plan will give due weight to both the scientific and the practical aspects of hygiene and public health.

II. THE SITUATION AND THE NEEDS IN AMERICA

In this country we are woefully lacking both in laboratories of hygiene and in opportunities for training in public health work. Three or four medical schools have hygienic laboratories, but none is complete, and adequately equipped and supported. Still other schools attempt something in the way of instruction in this subject, but it is all inadequate and unsatisfactory.

The need for supplying these deficiencies is at present the most urgent one in medical education and in public health work, and is recognized on all sides. The cry comes loudest from public health officials, social workers and others interested in public health administration, national, state, municipal and rural, who realize the lack of trained leaders and trained workers in all grades of the service. Here with the rapidly growing appreciation of efficient public health organization new and promising careers of useful service are opening for those who are qualified by ability, character and training. Scarcely less important is it for medical students and physicians who engage in practice to be well grounded in the principles of hygiene and of preventive medicine. Furthermore, the advancement of knowledge in this field, the cultivation of hygiene as a science, is one of the great needs of this country and should be a fundamental aim of an institute of hygiene.

III. VARIOUS CLASSES TO BE TRAINED

The first and in many respects the most important class of persons who will seek to be trained in a school of public health are those who expect to devote their lives to health work in some of its branches. These will aim to become for the most part public health officials or to be engaged in some capacity in public health service, but some may become teachers or be connected with institutions or find other opportunities for a career in the ever widening field of sanitation. It is of the first importance

to consider and to supply the needs for the education of prospective public health officials.

Without attempting an exhaustive analysis, the following classification will suffice to indicate the various types of officers or experts required in public health administration:

1. Higher administrative officials, as commissioners of health and health officers in cities and districts, and division or bureau chiefs in the larger state and city departments of health.

2. Health officers in towns, villages and rural communities.

3. Higher technical officials or experts, as statisticians, sanitary engineers, chemists, bacteriologists, diagnosticians, epidemiologists, etc.

4. Inspectors of various kinds, as school, sanitary, food, factory, etc. inspectors.

5. Public health nurses.

With this class may be included those preparing to enter the Public Health Service of the federal government.

An institute or school of hygiene should furnish suitable training for all of these, and while courses adapted for special needs will be supplied, it does not seem desirable to conceive of such an institute as constituted primarily to provide training for higher or lower grades of the service so much as to furnish opportunities for a good general education in all branches of hygiene.

While it is hardly possible to overestimate the importance of providing opportunities for the training of those who are to become public health officials, the need here is at present so acute that there is some danger of overlooking the conception of hygiene as a science and art which is much broader than its applications to public health administration. Hygiene includes much more than state medicine. It is not necessary to consider here the distinction sometimes made, especially in this country, be-

tween hygiene and sanitation. In this report the term "hygiene" is used to include both, that is, the whole body of knowledge and its application relating to the preservation and improvement of health of individuals and of the community and to the prevention of disease.

With this broad conception it is obvious that the educational and scientific opportunities of an institute of hygiene should not be limited to the use of those who intend to become specialists in public health work and should cover a wider field than that of state medicine or sanitation.

It is of the utmost importance that education in the principles of hygiene should be available for students and graduates in medicine who are to engage in the practice of their profession. With the present crowded medical curriculum obligatory courses in hygiene for undergraduate students of medicine must necessarily be restricted, but with the tendency toward greater freedom of election of medical studies there is the need and opportunity to provide more extensive optional courses in hygiene. There is a wide field for the establishment of graduate courses in hygiene for physicians. Even in Great Britain, where the character of training is designed almost wholly for public health officials, many who intend to become medical practitioners secure the diploma in public health. The mission of the practising physician is in many respects changing, and there can be no doubt that a year or more of graduate work in hygiene would be eagerly sought by many physicians and would greatly increase their capacity of useful service to their patients and to the community, if the proper opportunities for such work were provided.

Sanitary engineering has become a specialized profession, and the institute of hygiene should combine with the engineering school in supplying the requisite training.

The public health nurse, both as a part of the public health service and independently of such connection, is

destined to play a rôle of increasing importance in the improvement of conditions of healthy living and working and in the control of infectious and industrial diseases in this country. The institute of hygiene should co-operate with schools and organizations for training nurses in meeting the need for a supply of trained public health nurses.

When one considers the many points of contact between the modern social welfare movement and the public health movement, and to what an extent social and economic factors enter into questions of public health it is clear that an institute of hygiene must take full cognizance of such factors and that students of social science should profit by certain opportunities in the institute, as well as students of hygiene by training in social science and social work.

An important class to be provided for in an institute of hygiene will be those engaged in special advanced work in some branch of the subject and in original investigations of hygienic problems. A main function of the institute should be the development of the spirit of investigation and the advancement of knowledge, upon which intelligent public health administration and individual hygiene are absolutely dependent. It will be especially from this class of advanced workers and investigators and from the group of assistants in the institute that the teachers and the authorities and experts in hygiene will be recruited for service in different fields of activity and the standards of the profession of hygiene and of public health will be elevated.

IV. FIELD TO BE COVERED

The field covered by the terms "hygiene," "sanitary science," "public health," "preventive medicine" is so broad and varied that it is hardly possible within a brief compass to indicate all of the subjects here included. Strictly speaking the territory embraces a group of sciences or the application of various underlying sciences. Unity

is to be found rather in the end to be accomplished—the preservation and improvement of health—than in the means essential to this end. It is the focussing upon this definite purpose which gives coherence to the organized body of knowledge embraced under the designations “hygiene” and “sanitation,” and makes important its study and cultivation as a professional pursuit.

Although the practitioner of medicine should have knowledge of hygiene and of the means of preventing disease and has abundant opportunity in the practice of his calling to apply this knowledge, and the public health worker, if he is to prevent disease, must have knowledge of the origin, mode of spread and diagnosis of disease, still it is becoming increasingly clear that public health work constitutes a distinct profession, and the wider recognition of this fact will be an important result of the creation of institutes or schools of hygiene.

The wide scope of the professional training required for the well equipped public health worker is sufficiently indicated by the mere enumeration of the more important subjects to which more or less attention must be given in an institute of hygiene, at least so far as their scientific groundwork in relation to sanitation is required. Such subjects are vital statistics; epidemiology or the causation, spread and prevention of transmissible diseases, including tuberculosis and the venereal diseases; diagnosis of infectious diseases; industrial hygiene; sanitary parasitology, including bacteriology and immunology; sanitary chemistry; sanitary engineering; hospital construction and administration; housing, ventilation, heating, lighting; disinfection; the hygiene of air, soil, water and climate; water supplies and sewage disposal; infant mortality and child hygiene; hygiene of schools; mental hygiene; heredity and eugenics; social hygiene; personal hygiene; diet and nutrition; rural, farm and dairy hygiene; milk supply; food and drug adulterations; nuisances; public health adminis-

tration and organization, sanitary laws and codes; quarantine and immigration; tropical hygiene; relation of animal diseases to human diseases; public education in healthy living; social service work; sanitary surveys.

V. AGENCY REQUIRED TO PERFORM THIS FUNCTION

The central, essential and main agency required to meet the needs which have been indicated is an institute of hygiene, housed in its own building, provided with the requisite laboratories and facilities and with its own staff of teachers giving their entire time to the work of teaching and investigating. Given such a central institute it is easy to add to the curriculum, when found necessary, certain courses which are now given, or could readily be supplied by various existing departments of the medical school, the engineering school or other faculties of the university. The mere assembling of such courses does not constitute a school of hygiene. The great need of the country to-day in the promotion of public health is the establishment of well equipped and adequately supported institutes or laboratories of hygiene, where the science of hygiene in its various branches is fruitfully cultivated and advanced and opportunities are afforded for thorough training in both the science and the art. It would be a misfortune if this broader conception of the fundamental agency required for the advancement of hygienic knowledge and hygienic education should be obscured through efforts directed solely toward meeting in the readiest way existing emergencies in public health service.

1. *Relation to a Medical School.*—The profession of the sanitarian or public health worker not being identical with that of the practitioner of medicine, the institute of hygiene, as the essential part of a school of hygiene, should have an independent existence and should not be regarded merely as a department of a medical school. But the medical school offers much which the institute of hygiene will require either as preliminary training or in course and

which it will not care to duplicate. In the interest of economy and efficiency, therefore, the school of hygiene should be closely related to a medical school of high standard in such way that the facilities of each should be open to the students of both.

It is likewise important for study and training in preventive medicine that the institute should have access to the facilities of a good general teaching hospital, as well as to various special hospitals. The need of opportunities for observation and study of patients in an infectious disease hospital is of course obvious.

2. *Connection with a University.*—To perform to best advantage its function, the institute should be a part of a university. The medical school has found such connection to be a practical necessity. The institute of hygiene would draw even more heavily upon certain schools or departments of the university, as those of engineering and of sociology. In addition to having at its disposal the facilities of the university, the institute would find the stimulating and sustaining scientific spirit and ideals of the university an indispensable asset.

3. *Separate Identity.*—While intimately related to the university and its medical school, the institute of hygiene should be established on its own foundation, and should preserve and emphasize its own identity as a separate institution devoted exclusively to the science and the service of health; it should have its own building, and its own corps of instructors with adequate provision for teaching and research.

While it is not difficult to bring together on paper a group of courses selected from the several schools and departments of the university and by the addition of a few new courses make a presentable prospectus of a school of public health, this is not the conception of such a school or institute as we believe will best fulfill the functions of developing the science and art of hygiene and of training

for this new profession. If the institute is to make itself felt as a constructive force it must have in it a group of scientific investigators and teachers whose absorbing interest is in developing the science of hygiene and applying it to the conservation of health.

While the concentration of work here advocated involves some duplication of equipment, this is not as large as might be supposed and, in view of the great advantages, does not constitute a serious objection. The institute must have its own chemical laboratory; it would be inconvenient and unsatisfactory in the extreme to attempt to use chemical laboratories devoted mainly to other purposes for the many important studies in sanitary chemistry. The principal microbiological laboratory of a medical school could without detriment be transferred to the institute of hygiene, although provision must exist for bacteriological work in the pathological laboratory, as well as in the hospital. Most of the other physical equipment of the institute would involve little duplication.

4. *Organization and Departments.*—At least in the beginning there should be a director of the institute, who will also be the head of one of the main divisions. Eventually the heads of these divisions may constitute a group or faculty with co-ordinate powers in directing the policy and affairs of the institute.

It is possible to indicate only in outline and in a general way the principal departments or divisions of an institute of hygiene, as details of organization and division of work should be left to the staff of teachers whose interests and qualifications will vary with the individuals.

a. *Chemical Division.*—The applications of chemistry to sanitary science and art are extremely important and varied, and already highly developed.

b. *Biological Division.*—Here there would be a number of subdivisions, as bacteriology, protozoology, medical zoology.

c. *Engineering or Physical Division.*—A part of this can best be provided for in the engineering school, but the institute should provide opportunities for the study of certain hygienic problems requiring the application of physical science.

d. *Statistical Division.*—While the various questions connected with the collection and study of vital statistics constitute the most important subject in this field, there are other important applications of statistical science to hygiene.

e. *Division of General Hygiene and Preventive Medicine.*—Under this broad heading may be included epidemiology, industrial hygiene, the principles of public health administration and other subjects not embraced under the previous captions.

The foregoing classification is not designed to be either final or exhaustive and is manifestly reduced to its simplest terms.

If qualified men can be found there should be three or four teachers of the rank of full professors, but in their absence it would be better to select even for some of the important divisions younger men of great promise with the grade of assistant professors or of associates. In addition to these probably at least eight or ten assistants at moderate salaries would be required.

As already stated, the institute once established on its own foundation will draw upon the medical school, the engineering school and other departments of the university for courses of instruction which it will not care to provide on its own grounds, and it will itself co-operate in furnishing instruction to students in other departments.

5. *Field Work.*—Hygienic excursions to inspect water-filtration plants, sewage disposal systems, methods of heating and ventilation and for kindred purposes constitute a valuable part of practical sanitary training. The most important training in the field, however, will be

provided by establishing working relations with state and municipal departments of health and with the United States Public Health Service. This arrangement will provide for giving to the students practical experience in every department of public health work. The students may in this way become acquainted under favorable conditions with the methods of handling the health problems of the large city as well as those of the rural community. There will be opportunity for participating in the work of sanitary surveys. Co-operation with the federal Public Health Service will give good opportunity for experience in quarantine work and in sanitary and epidemiological work on a large scale. Such relations will be mutually helpful. The states and cities will reap the benefit of intelligent and scientifically trained workers who will enter the service as real workers in all fields of its activities. The institute and its students in turn will have the benefit of this practical experience.

6. *Museum*.—An important feature of the institute will be a good hygienic museum, which will contain models, charts, preparations, and other material which can be gradually brought together. This will serve not only for demonstrative teaching, but also for the education of the public. The influence and usefulness of the institute will be extended by popular lectures, conferences and extension courses.

7. *Special Courses*.—The institute should provide for the needs of those already engaged in health work, who desire to pursue short courses or to do advanced work in special branches.

8. *Requirements for Admission; Certificates and Degrees*.—The details regarding the conditions for admission to the institute may be left to future consideration, but it should be stated that while the majority of candidates for diplomas and degrees will doubtless be graduates in medicine, these distinctions should not be limited to physicians.

The institute should be ready to receive and to reward with its diplomas and degrees all who come with a satisfactory preliminary education and pursue the required training, which need not be rigidly uniform for all matriculates. Even those who may not meet the requirements for matriculation and become candidates for the degree may find opportunity to pursue special courses of study. It has been abundantly demonstrated that the profession of public health work can be successfully followed by sanitarians whose principal training has been in sanitary engineering, sanitary chemistry and sanitary biology.

9. *Influence of the Institute.*—The benefits to be expected from the establishment of such an institute as that proposed are not to be measured solely by the number of students trained within its walls. The institute can supply only a relatively small number of those who desire to enter upon public health service. The far-reaching influence of the institute should be felt in the advancement of the science and the improvement of the practice of public health, in establishing higher standards and better methods of professional education in this field, in stimulating the foundation of similar institutes in other parts of the country, in supplying teachers and in co-operating with schools of a simpler character designed for briefer technical training which should be established in each state in connection jointly with boards of health and medical schools.

(Signed) WILLIAM H. WELCH.

(Signed) WICKLIFFE ROSE.

APPENDIX VI

EXPENDITURES FOR WAR WORK

To DECEMBER 31, 1916

RELIEF WORK

	1914	1915	1916	Totals
ARMENIAN AND SYRIAN RELIEF:				
Contributed for the relief of suffering in the Turkish Empire and Northwestern Persia.....	.....	\$70,000.00	\$490,000.00	\$560,000.00
BELGIAN RELIEF:				
Food Supply:				
The greater part of five cargoes of supplies sent to Belgium	\$979,042.37	2,839.54	.....	981,881.91
Clothing:				
Given to the Commission for Relief in Belgium for the purchase of material for clothing, to be imported into Belgium and manufactured by Belgian labor.....	.....	200,000.00	.....	200,000.00
Relief Work in Holland:				
Establishment of an organization in Rotterdam for receiving, sorting and shipping clothing contributed from all parts of the world for Belgian sufferers; organization of Belgian women refugees into sewing and knitting classes; sewing machines and materials.....	.....	78,410.94	.....	78,410.94
Stipends for Belgian professors in England.....	5,000.00	20,000.00	5,000.00	30,000.00

Belgian Children:

Expended under the Foundation's guarantee of the cost for one year of maintaining and educating 500 Belgian children in Switzerland. (Contributions from other agencies for this purpose have been received as follows:

Belgian Relief Fund of New York City \$25,000.00
 New England Belgian Relief Fund . . . 10,000.00
 Refugees Relief Fund 3,000.00

\$38,000.00)

..... 25,000.00 25,000.00

POLISH RELIEF:

Expended from the appropriations of \$1,000,000 for relief in Poland, Serbia, Montenegro and Albania.

..... 25,531.32 25,531.32

SERBIAN RELIEF:

Contributed to the American Red Cross for the relief of destitution.

5,000.00 59,562.72 64,562.72

TURKISH RELIEF:

To enable the Red Cross to respond favorably to an application from the Turkish government and the Red Crescent through the American Embassy, for aid in relief work in and about Constantinople.

..... 25,000.00 25,000.00

..... 6,377.00 6,377.00

OTHER SMALL CONTRIBUTIONS.

WAR RELIEF COMMISSION:

Administration.

5,570.69 31,757.10 34,318.51

Total, Relief Work.

\$989,613.06 \$408,007.58 \$671,239.55 \$2,068,910.19

SOLDIERS' WELFARE WORK

INTERNATIONAL COMMITTEE OF YOUNG MEN'S CHRISTIAN ASSOCIATIONS:

For the establishment of Y. M. C. A. organizations and buildings in military and prison camps in Europe.....

For the establishment and maintenance of recreation centers in connection with the military forces on the Mexican border.....

For the purchase and administration of suitable collections of books to be maintained at the several brigade headquarters along the Mexican border.....

WAR RELIEF COMMISSION:

Prisoners of War Welfare Work.....

Total, Soldiers' Welfare Work.....

	1914	1915	1916	Totals
.....		\$25,000.00	\$200,000.00	\$225,000.00
.....		85,000.00	85,000.00
.....		10,000.00	10,000.00
.....		378.00	378.00
.....		\$25,000.00	\$295,378.00	\$320,378.00

MEDICAL AND SURGICAL WORK

AMERICAN RED CROSS:

To meet the expenses of sending a detachment of physicians and nurses to Europe.....

AMERICAN SANITARY COMMISSION FOR SERBIA:

Contributed for organization and maintenance of the Commission, in co-operation with the American Red Cross, to combat an epidemic of typhus.....

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH:

Support of surgical laboratory at Campiègne under the direction of Dr. Alexis Carrel.....

Total, Medical and Surgical Work.....

	1914	1915	1916	Totals
\$10,000.00		\$10,000.00
.....		\$99,332.00	.....	99,332.00
5,000.00		25,000.00	\$25,000.00	55,000.00
\$15,000.00		\$124,332.00	\$25,000.00	\$164,332.00

SUMMARY OF EXPENDITURES FOR WAR WORK

	To DECEMBER 31, 1916			Totals
	1914	1915	1916	
RELIEF WORK.....		\$408,007.58	\$671,289.55	\$2,068,910.19
SOLDIERS' WELFARE WORK.....	\$989,613.06	25,000.00	295,378.00	320,378.00
MEDICAL AND SURGICAL WORK.....	.....	124,332.00	25,000.00	164,332.00
	15,000.00			
Total.....	\$1,004,613.06	\$557,339.58	\$991,667.55*	\$2,553,620.19

*The total appropriations for 1916 were \$2,590,000. The amount of \$991,667.55 shown for 1916 represents merely the sum actually expended by the Foundation during 1916 on account of the various appropriations made during the year.

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